CELSIS 6100 Scanners

Operator's Manual
6700-7060-02A

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This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

About this Document

This manual describes the operation of the Celsis 6100 Scanners.

Chapter 1 provides a general introduction.

Chapter 2 provides safety information. The contents of this chapter must be understood before you operate the equipment.

Chapter 3 describes the function of each switch, button and display.

Chapters 4 to 9 describe the basic scanner operating procedures. The information in these chapters will enable you to perform scans with facsimile reproduction.

Chapters 10 to 15 describe the more advanced scanner operating procedures which can be used to enhance the output images.

Chapter 16 describes care and maintenance procedures for the scanner.

Chapter 17 describes scanner fault messages and their meanings.

Chapter 18 lists reference information which will be useful when operating the scanner.

Associated Documents

Celsis 6000 Macintosh User Interface Manual 6700-6880

Celsis 6130/6150 Installation Manual 6700-6900

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Introduction 1

This chapter introduces the Celsis 6100 Scanners and includes a description of the ancillary equipment supplied or used with them.

1.1 The Scanner

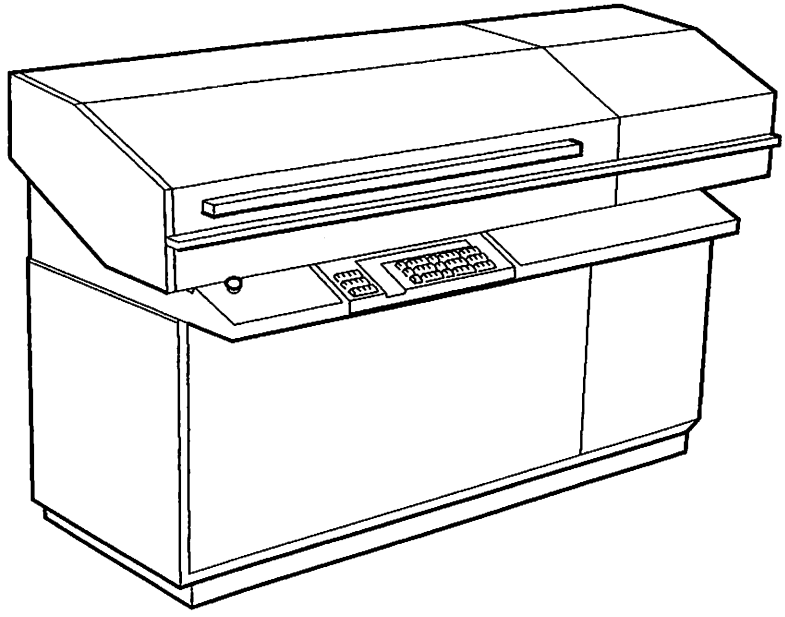

Figure 1.1 Magnascan analyse unit

The Celsis 6100 Scanners are high-speed, high-quality colour scanning units. Either transmission or reflection copy can be scanned to produce up to four separations per scan. These

scanners offer higher productivity than previous Crosfield equipment, due to the increased scanning speed and higher level of automation.

Images are output via links to a range of options. Typical examples are listed below:

- Direct to a Crosfield E, EA or M Output Scan Station (trade scan option).

  When operating in this configuration the layout of the exposed separations can be controlled from the Celsis 6100 Scanner. Batch scanning is available with this option.

Via SCSI link:

- To a desktop publishing system such as Magnalink 2 or 3.

  This option provides an image capture system. Batch scanning is possible with most configurations. The expose layout will be controlled by the expose software, MagnaRip for example.

- To an electronic page composition system such as Studio 9000.

- To any of the options listed above, but with the SCSI link connected to Crosfield's Graphic Arts Local Area Network (GALAN), to provide access to remote destinations.

Note: A Crosfield HSI terminal is required to control the interfacing with GALAN.

1.2 Operating Principles

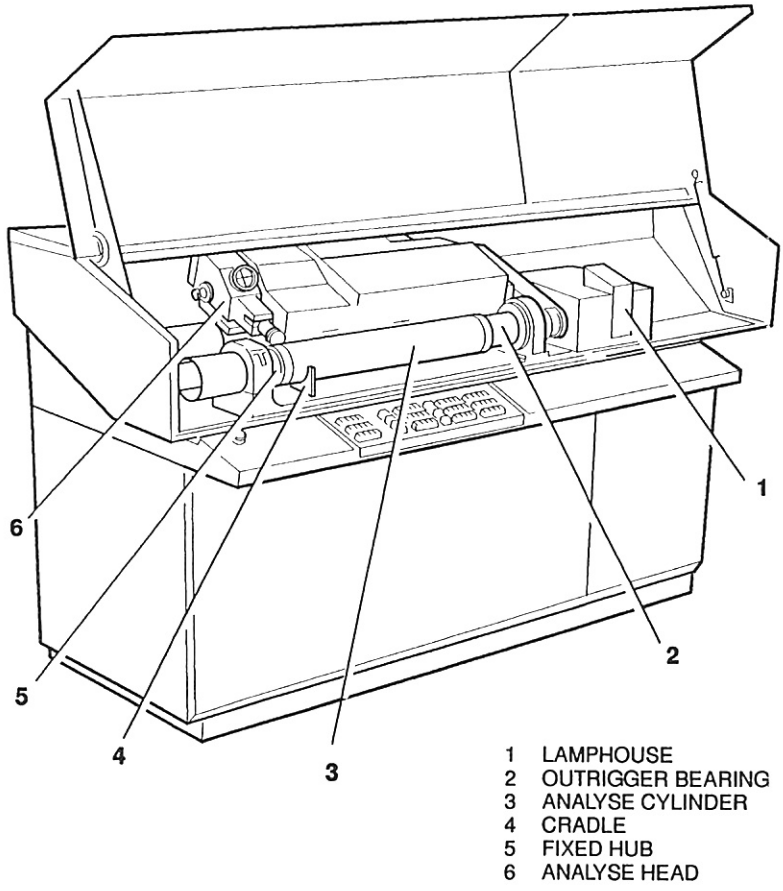

Figure 1.2 Analyse unit

A clear cylinder, carrying the transmission or reflection copy on its outer surface, is rotated at constant speed by a motor. The copy is scanned by a small spot of light that moves at constant speed parallel to the axis of the cylinder. The scanning spot is produced by an optical system contained in a carriage. The carriage also contains the input electronics. The carriage is moved at a constant speed for a given scan rate along the leadscrew, by another motor.

A precise servo control system enables the carriage to move at a slow speed or at a fast speed in either direction. The carriage can also move accurately to a pre-determined position. The limits of carriage traverse are set by micro-switches which are mounted close behind the leadscrew.

The leadscrew and cylinder run in high precision ball bearings that are housed in bearing blocks.

The outrigger bearing block can be moved away from the fixed bearing block to enable insertion or removal of the cylinder. The outrigger bearing block is moved by a toggle-lever mechanism. This mechanism is actuated by movement of the carriage near the right-hand limit of traverse. When the carriage moves in the opposite direction, the outrigger is returned to its operating position by a compression spring.

The bearing blocks are screwed to a cast iron beam, that is supported by a strong steel frame. Covers are attached by screws or lugs to this frame, and power supplies and printed circuit boards are supported within it.

1.2.1 Analyse Cylinders

There are two interchangeable Perspex (Plexiglass) analyse cylinders, one large and one small. The cylinders will take originals to a maximum size of 505 x 710 mm (large) or 505 x 355 mm (small). Enlargement from 20 to 2000% is of guaranteed quality, and 20 to 3199% is possible. Copy must be mounted on the cylinder using a loading table.

Each cylinder is located on the cylinder hub by a small slot cut at theend of the cylinder. When a cylinder is fitted, a locating ball fitted to the left-hand hub engages the slot at that end of the cylinder.

The cradle has two operating positions, one for each cylinder. In the upright position, it provides support for the smaller cylinder when loading. In the lowered position it performs the same

function for the larger cylinder. The two cradle rests are mechanically linked so that raising one will raise the other.

By the left-hand hub, behind and above the centre, there is a sensor mounted in the bearing block. This sensor detects the presence of the large cylinder and so prevents damage to the analyse head.

If the smaller cylinder is fitted the machine will not release it unless the cradle is upright. Similarly, if no cylinder is fitted, the carriage will not traverse unless the cradle is upright. If you want to traverse the carriage in order to change the centre optics lens, raise the cradle.

The cylinder cannot be released accidentally whilst it is rotating.

1.2.2 Lamphouse

The box at the right-hand end of the unit contains a stabilized 150 W xenon lamp that emits an intense white light. Safety precautions must be taken before changing the lamp. For greater stability the lamp is best left switched on continuously, e.g. overnight and at weekends.

Lenses, prisms, mirrors and beam-splitters can produce three different light paths for use when:

- scanning transmission copy
- scanning reflection copy
- viewing transmission copy.

The required light path is selected by movement of vanes or mirrors, attached to solenoids.

The **transmission copy** beam travels from the lamphouse, along the centre optics tube to a prism at the end. The prism reflects the beam through 90° so that it passes through the perspex analyse cylinder and the transparency. Knobs at the right-hand side of the

1

lamphouse provide adjustments for the transmission copy beam. A neutral filter selection knob is located at the right-hand side of the lamphouse. The neutral density filters are used in conjunction with apertures in the analyse head so as to maintain the required light levels on the photomultipliers.

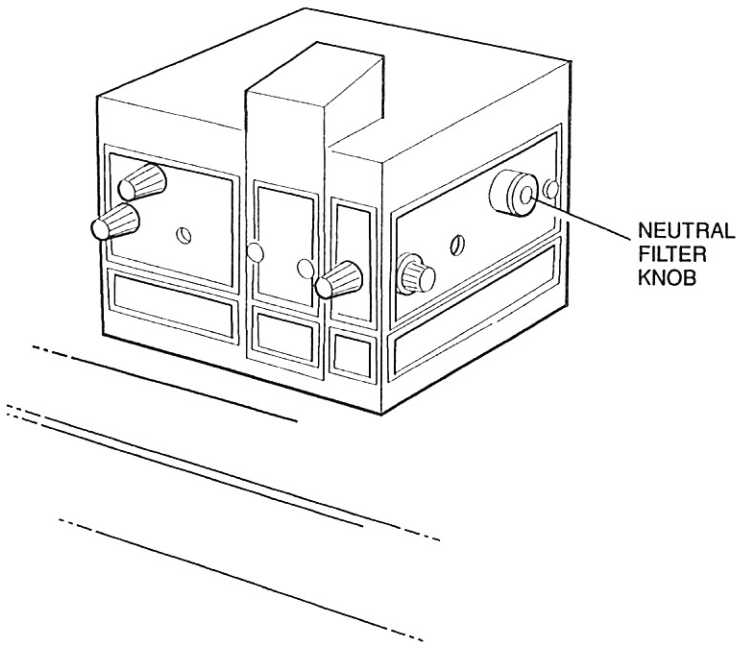

Figure 1.3 Lamphouse

The **reflection copy beam** travels along a fibre optics light guide that splits into three light guides. These three guides are fixed so that their light beams converge to produce a fine spot of light on the reflection copy. This arrangement avoids direct reflection of light from the reflection copy into the analyse lens. Knobs at the left-hand side of the lamphouse provide adjustments for the reflection copy beam.

The **viewing beam** travels along a perspex light guide to a diffuser at the end of the centre optics tube. This results in general illumination of transmission copy.

1.2.3 Centre Optics Tube

The centre optics tube moves inside the analyse cylinder when the carriage traverses. There are two centre optics lenses, ('scanning' lenses), one for the large cylinder, the other for the small cylinder. The centre optics lens focuses a fine spot of light onto the transparency. The required lens is installed into the end of the tube, except when scanning reflection copy. In this case a blanking plug is installed to prevent unwanted transmission of light.

The centre optics tube also provides illumination for transparencies. When the View mode is selected the centre optics tube provides background illumination at a reduced intensity. This enables viewing the transparency over a larger area than is used for scanning.

1.2.4 Analyse Head

The illuminated spot on the original is at the focus of the analyse lens, which is mounted in the analyse head. Light passes through this lens and is reflected through 90° by a prism onto the dichroic assembly. The dichroic assembly separates the red, green and blue components of the light, and reflects these onto three photomultipliers.

The analyse head is the scanning eye of the analyse unit. The analyse lens is mounted in a metal tube which can be set in two positions, to suit the analyse cylinder in use. Fixed to the lens mounting is a focus control to adjust the focus of the lens at two positions.

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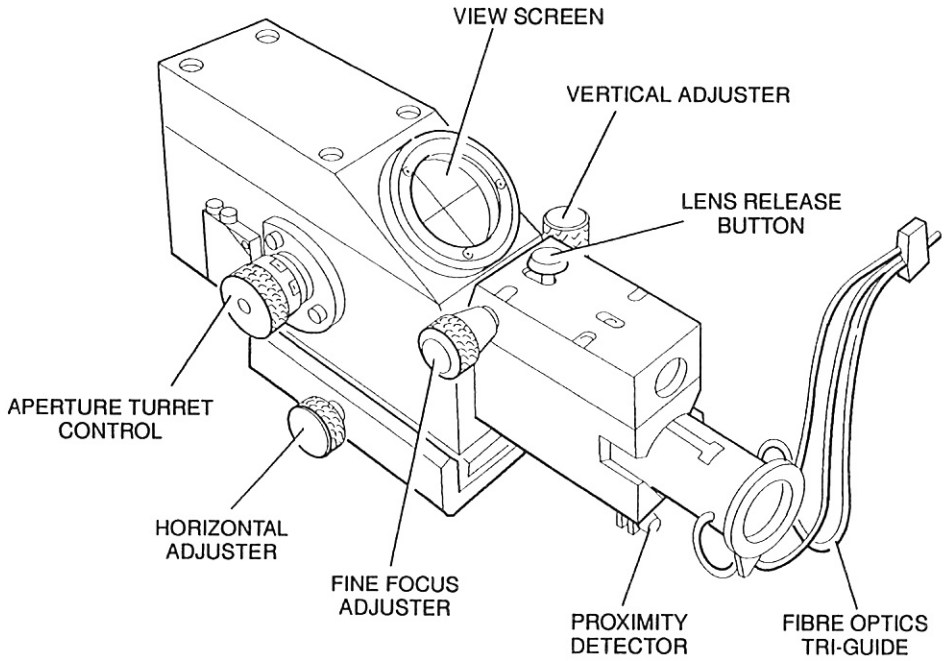


Figure 1.4 Analyse head

The knob on the top of the analyse head, and the one on the front left-hand side of the head are centering controls, used to align the head with the light coming through the transparency.

The aperture knob, at the rear left-hand side of the analyse head, is used to select the correct size of scanning light spot to suit the enlargement required.

When the View mode is selected, a movable mirror reflects a magnified image of the scanned area of the original onto a ground glass screen.

1.2.5 Signal Flow

Each photomultiplier produces a small electric current which is proportional to the amount of light falling on it. Electronic circuits convert these red, green, and blue current levels to three digital signals, which represent the cyan, magenta and yellow components of the light. The digital signals are processed as required for detail enhancement, under-colour removal, colour correction, etc.. The black separation (black printer) is generated from the red, green and blue signals.

The fully processed digital signals pass along a cable to the expose unit.

1.3 Macintosh

The Celsis 6100 Scanners are equipped with a Mac terminal. The software supplied for the Mac provides additional facilities which are summarized below:

- Receiving and storing prescan images and Job files.
- Viewing prescan images.
- Cropping of pre-scan images.
- Multi-point examine and display of original density and dot %.
- Alternative scanner controls, using the Mac instead of the analyse unit keyboard.
- Additional controls used to perform tasks such as specifying image destinations, file format selection, batch scanning control and border text entry.

Full user instructions are provided in the Celsis 6000 Macintosh User Interface Manual, see Associated Documents.

1

1.4 Ancillary Equipment

1.4.1 Transparency Viewer

A transparency viewer is a light-box, that may be wall-mounted to facilitate the examination of transparencies and separations. A sheet of opal glass is evenly illuminated by fluorescent tubes which are mounted inside the box. For correct assessment of colour transparencies, the light source should have a colour temperature of 5,000 K. Tubes of incorrect type or old tubes may cause errors of judgement.

The transparency viewer is not supplied by Crosfield Electronics.

1.4.2 Repropak

The Repropak is a folder containing transmission and reflection copy subjects, grey scales etc.. The pack is designed for use as a standard for scanner reproduction. Instructions for use are included in the pack.

1.4.3 Loading Table

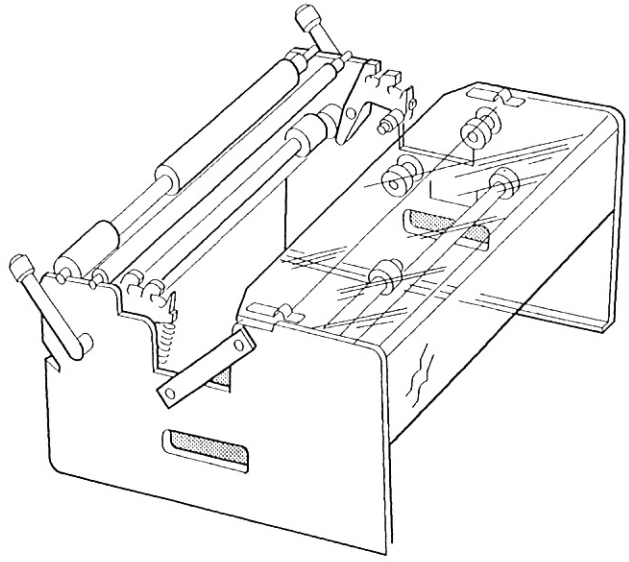


Figure 1.5 Loading table

Both transparencies and flexible reflection copy may be mounted on cylinders using the loading table (7503-2420). The loading table should be fitted over a light table so that cylinders and transparencies may be illuminated from below. The rollers are kept on a storage shaft that fits in grooves at the back of the mounting table, next to the grooves for the roller shaft.

1

1.4.4 Operator's Pack

An Operator's Pack is supplied with each scanner. It consists of tools, safety equipment and consumable items. These items can be ordered separately from Crosfield and have been listed with part numbers in the following table.

Description	Part No.
Printed Rule (Flexible)	5511-4280
Xenon Lamp, Top Lead Assy	7503-0940
Cylinder Cleaning Tool	7503-2410
Can Of Maccurat 32 Oil	7503-6170
Xenon Lamp, 150 W, Gas Filled	7513-8540
Mains Supply Cable, 16 A	7533-7560
Tool, Allen Key, Hexagonal, 3 mm	9990-3411
Tool, Pliers, Slip Joint, 6 inch	9990-4013
Lubricant, Petroleum Jelly	9996-2068
Head Band, Safety	9998-9349
Visor, Clear, Safety	9998-9354
Gauntlets, AA/5C	9998-9402

1.5 Operator Features

The Celsis 6000 software provides the user with a broad range of facilities, which are dealt with fully in later chapters. Features of particular interest are highlighted in this section.

1.5.1 Polychromatic Colour Removal (PCR)

This function enables separations to be provided, by the scanner, in which the third colour content is replaced by black. All predicted densities and dot percentages are shown in the normal 4-colour mode. The amount of 'clean out' of the third colour can be adjusted and a black compensation term is provided as in the normal UCR function.

1.5.2 Selective Colour Correction

In addition to the basic colour correction facilities, Celsis 6000 also offers colour selective correction in the Cyan, Magenta, Yellow, Blue, Red and Green colour regions.

1.5.3 Cast Removal

Controls are provided which allow neutralization of colour cast. The controls are colour selective and can be specific to highlight, mid-tone, or shadow regions.

1.5.4 Pastel Colour Boost

This function enables non-saturated colours to have extra colour correction applied to them. The pastel colour boost function controls the degree of boost and also the density point of the peak boost value. It is also possible to apply pastel boost colour selectively.

1.5.5 Enhanced Colour Correction

This function is similar to Pastel Colour Boost but instead of only increasing the two highest colour channels, this function also decreases the lowest channel.

1.5.6 Tone Boost

This function allows specific regions of the tone range to be adjusted to meet the gradation requirements of each original. Independent adjustment is possible in the highlight, $^1/_4$-tone, midtone, $^3/_4$-tone and shadow regions.

1.5.7 Flexible USM

USM facilities include the following features:

- A smoothing control for areas of low detail contrast and also for areas of high density.
- A facility enabling any three 'fringe' signals to be applied to any of the colour channels, including the black channel, to improve the appearance of an original. For example, a

magenta fringe applied to the cyan colour channel improves the appearance of a flat 'blue sky' type of original.

- Control over fringe characteristics, which allow a sharpness fringe to be generated on the black printer.

1.5.8 Enlargement

Two sizes of analyse cylinder provide enlargement between 20 and 3199%. Picture distortion can be specified by entering different vertical and horizontal enlargement factors. A micro-enlargement facility is also available. It is of particular value when scanning transparencies and reflection-copy text, where a good fit between the two is required.

1.5.9 Variable Resolution

Any resolution between 4 and 49.9 lines/mm can now be selected. Horizontal and vertical resolutions are set independently. The resolutions which you can use will still depend on the range supported by the expose unit.

1.5.10 Step and Repeat

The Step and Repeat function enables multiple exposures of an image to be made in each format size. The function can be used with manual formatting or Autoformat.

1

Safety 2

This chapter provides important safety information and must be read before switching on or operating the equipment.

2.1 Health and Safety at Work

All personnel are advised to familiarize themselves with any local or national legislation relating to health and safety at work. Particular attention should be given to those sections covering personal responsibility regarding safe working practices which must be strictly observed at all times.

This chapter explains the safety conventions used in this manual and highlights safety practices specific to this equipment.

2.1.1 Warnings and Cautions

There are two safety categories, namely WARNINGS and CAUTIONS.

WARNINGS are given for conditions which may endanger the safety of personnel.

WARNING

The instructions given in warnings must be followed precisely. They are given to avoid injury or death.

CAUTIONS are given for conditions which may cause damage to equipment or materials.

CAUTION

The instructions given in cautions must be followed to avoid damage to equipment or materials.

2.2 Smoking

CAUTION

Smoking near Celsis 6100 Scanners leaves deposits on their optical components, degrading the quality of scanned images. This damage can be difficult and expensive to repair.

2.3 Clothing and Jewellery

Do not wear clothing or jewellery which could be hazardous when in contact with any part of the equipment, or which could reflect laser light into an eye.

2.4 Equipment and Tools

Use the tools and wear the protective clothing as may be recommended.

2.5 Site Safety

Most accidents will be avoided if you follow these simple rules.

- Learn the location of mains switches and equipment on/off switches.
- Always obey the warnings, cautions, and any other instructions included in this and relevant equipment manuals or attached to the equipment.
- Never attempt to perform procedures that are not included in this manual.

WARNING

Do not attempt to rotate a stuck leadscrew by hand unless the power to the scanner is OFF. Failure to observe this precaution MAY RESULT IN INJURY.

2.5.1 Safety Devices

Ensure that all safety controls, such as brakes, interlocks, circuit brakes, indicators, covers, guards and warnings labels are present and functioning correctly, before handing over the equipment to the customer.

Unless essential for commissioning or servicing and under prescribed conditions, never override, negate or otherwise bypass safety controls, such as brakes, interlocks, circuit breakers, indicators, covers and guards.

2.5.2 Attending Equipment

Never leave equipment unattended unless in a safe condition with respect to mechanical, optical, chemical, electrical or other hazards.

2.6 Mechanical Safety

The following basic precautions apply to the system, and also to the equipment with which it is used.

- Do not attempt to lift heavy equipment on your own Obtain assistance from able-bodied persons or use suitable equipment as instructed in the manual.
- Always close equipment doors and access panels to prevent anyone colliding with them.
- Avoid leaving electrical cables trailing where anyone may trip over them.
- Make sure that mechanical servicing is undertaken only by properly authorized personnel.

WARNING

If both scanner lids are open and the left-hand lid is closed, the right-hand lid will close unaided, causing possible injury.

2.7 Electrical Safety

- Check mains cables regularly to ensure that they are not worn or damaged.
- Ensure that water and other liquids do not come into contact with the equipment.
- Do not attempt to operate the equipment when flammable or volatile substances are present in the atmosphere.
- Ensure that the correct type of fire extinguishers (BCF or CO_2) are present in the operating areas, and that they are regularly serviced.
- Ensure that electrical servicing is undertaken only by properly authorized personnel.

2.8 Chemical Safety

The following guidelines must be followed when storing or handling highly flammable liquids.

- Store bulk supplies in a metal cabinet marked with a 'flammable liquid' label of an approved design.
- For use in the work area, decant the liquid to a container with a maximum capacity of 250 cc. The use of a safety dispenser is recommended.
- Do not use the liquid near to non-flame proofed electrical equipment.
- Do not use the liquid near to a naked flame. DO NOT SMOKE.
- Avoid skin contact. Wear protective gloves.
- Avoid contact with eyes. Wear goggles.
- Use only in a well ventilated area.
- In case of a fire, use only an appropriate type of extinguisher, such as Aqueous Film Forming Foam (AFFF), or Dry Powder.

2.9 Safety Labels

Safety labels are fitted to the equipment to warn you of potential hazards. These labels must not be defaced or removed. Only safety labels which can be seen when the equipment is installed and operational are listed.

A label is fitted to the left-hand lid. See Figure 2.1. It warns that the lid (cover) must be closed before an expose sequence is started.

A label is also fitted to the right-hand lid. See Figure 2.2. It warns that the right-hand lid closes automatically when the left-hand lid is closed.

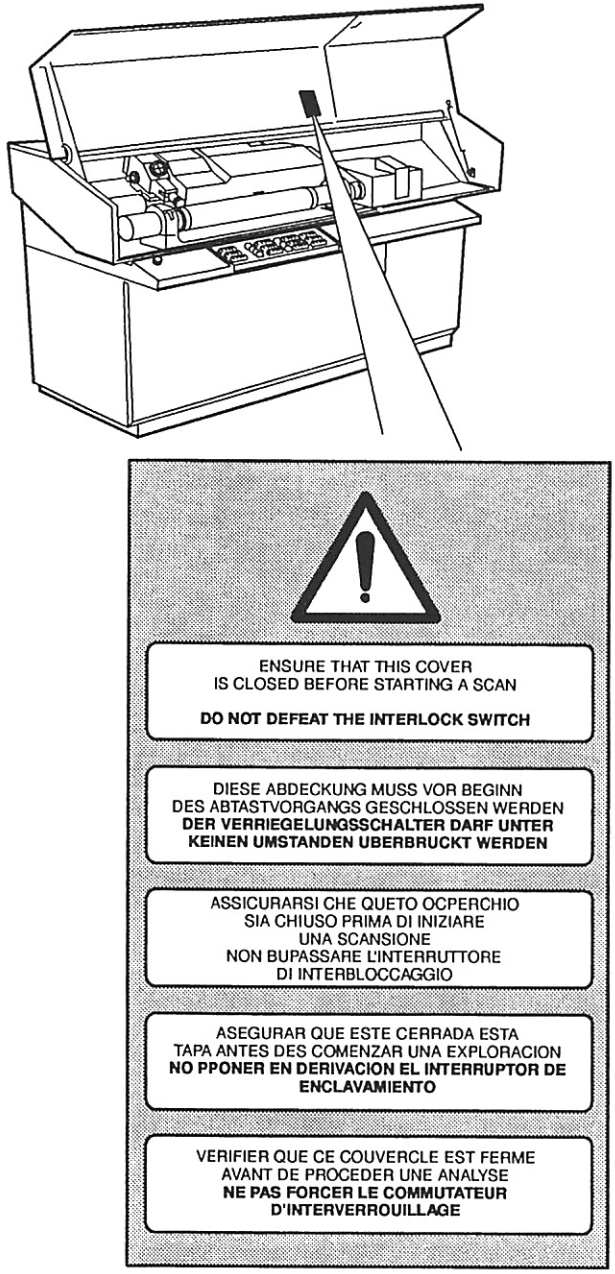

ENSURE THAT THIS COVER
IS CLOSED BEFORE STARTING A SCAN
DO NOT DEFEAT THE INTERLOCK SWITCH
DIESE ABDECKUNG MUSS VOR BEGINN
DES ABTASTVORGANGS GESCHLOSSEN WERDEN
DER VERRIEGELUNGSSCHALTER DARF UNTER
KEINEN UMSTANDEN UBERBRUCKT WERDEN
ASSICURARSI CHE QUETO OCPERCHIO
SIA CHIUSO PRIMA DI INIZIARE
UNA SCANSIONE
NON BUPASSARE L'INTERRUTTORE
DI INTERBLOCCAGGIO
ASEGURAR QUE ESTE CERRADA ESTA
TAPA ANTES DES COMENZAR UNA EXPLORACION
NO PPONER EN DERIVACION EL INTERRUPTOR DE
ENCLAVAMIENTO
VERIFIER QUE CE COUVERCLE EST FERME
AVANT DE PROCEDER UNE ANALYSE
NE PAS FORCER LE COMMUTATEUR
D'INTERVERROUILLAGE

Figure 2.1 Safety label on analyse unit, left lid

2

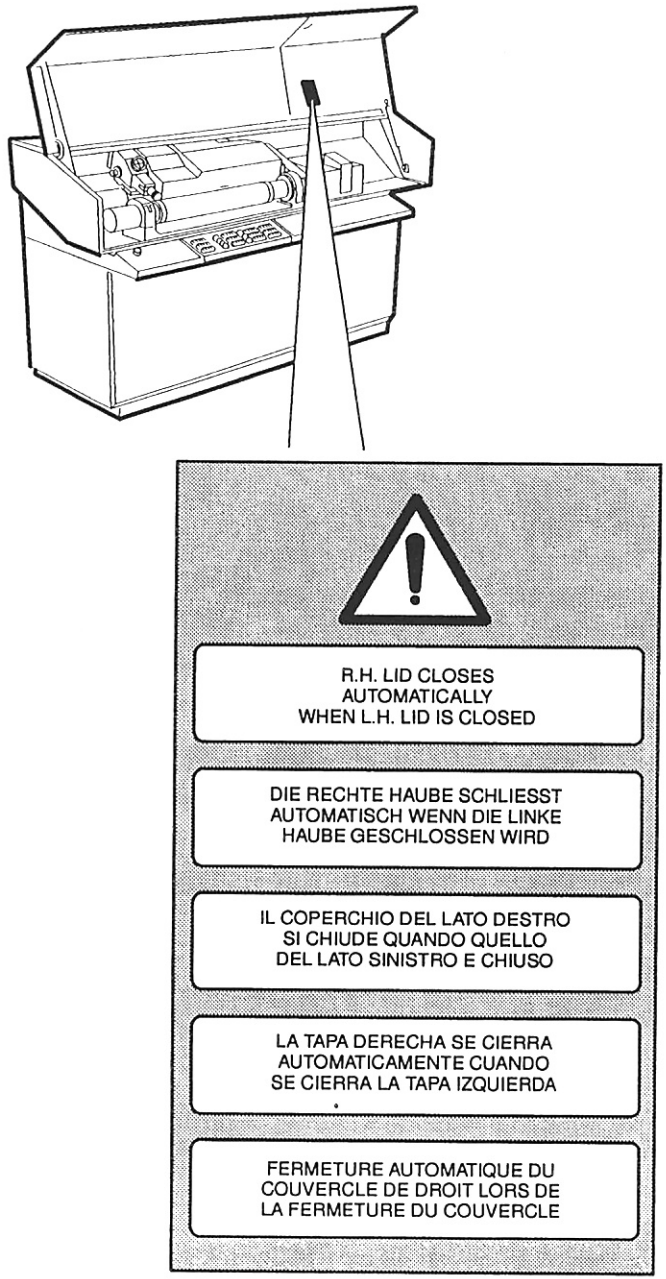


Figure 2.2 Safety label on analyse unit, right lid

Scanner Controls 3

This chapter describes the switches, buttons and indicators which are found on the Celsis 6100 Scanners. In each case a summary of the functions is provided. Further details of the use of these buttons and switches is given in later chapters.

3.1 Power Switches

The control panel carries three power switches (see Figure 3.1) and the keyboard. The **LAMP** and **SCANNER** switches are recessed in the panel side.

The Emergency-Off switch is at the left-hand end of the control panel. It removes all electric power from the Celsis 6000 when pressed.

WARNING

The cylinder will continue to rotate under its own momentum after the power has been removed. Sufficient time must be allowed for the cylinder to come to rest, before opening the lid of the unit.

The **SCANNER** switch controls the power to all the circuits in the Celsis 6000 except the lamp power supply and the cooling fans.

The **LAMP** switch controls the power to the lamp power supply and the cooling fans.

For starting procedures, see Chapter 4.

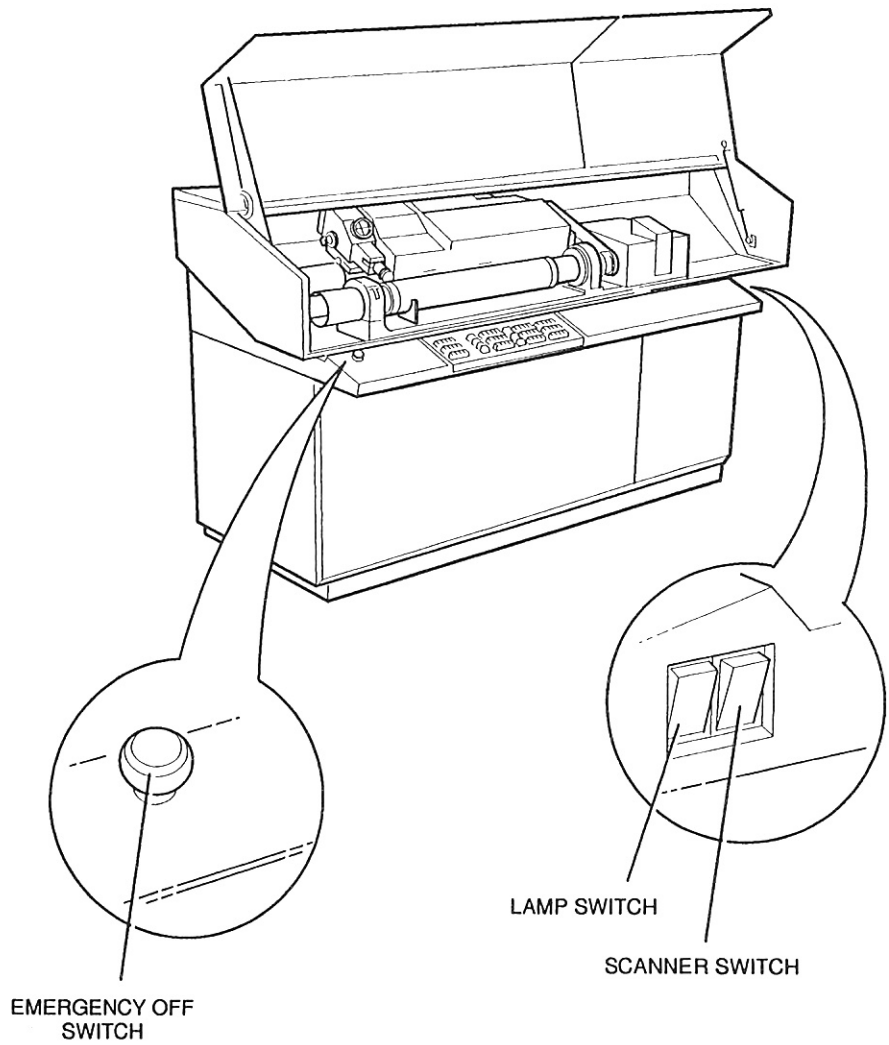


Figure 3.1 Control panel switches, analyse unit

3.2 Xenon Lamp Supply

Removal of the left-hand front panel from the scanner will reveal the xenon lamp supply (XLS). The front panel of the XLS carries the push button used when starting the lamp on older machines.

3.3 Keyboard

The keyboard carries two displays and a number of pushbuttons arranged in groups. The displays are the Alphanumeric Display and the Current Value Display. The groups of buttons are listed as follows:

- Operator Control Buttons
- Channel Select Buttons
- Keypad Buttons
- Editorial Control Buttons
- Scanner Control Buttons.

Some of the buttons have more than one function. Each button and display is described in the following text.

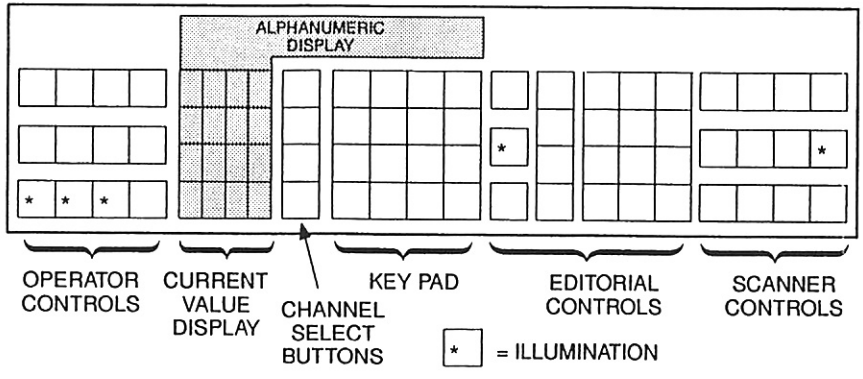


Figure 3.2 Scanner keyboard

The panel lights are normally left on, but when working under dark room conditions, they must be turned off. Illumination is selected or deselected using **[CAL] 0**.

Note: When operator panel buttons are identified by alphabetic inscriptions, the buttons are printed in this manual in bold type and enclosed in brackets, e.g. **[FINAL SIZE]**.

Where the alphanumeric displays are referred to in this manual they are printed in bold text, e.g. **AUTOBAL YES?NO?**.

3.3.1 Single Bleep

A short bleep is sounded whenever a keyboard button is pressed, to call attention to the displays. This is usually performed in response to an operation, but sometimes the scanner performs a sequence of operations by itself. In that case, it monitors the progress of the sequence by means of displayed messages and gives a bleep for each message.

Sometimes the bleep accompanies an error message.

3.3.2 Double Bleep

A double bleep is given if the wrong type of data is entered in PCR and/or OUTPUT CAL entries, i.e. density values instead of dot % values.

3.3.3 Triple Bleep

The triple bleep is a warning.

Sometimes a failure occurs in the machine; a failure message is displayed and three bleeps sound.

Sometimes the operator may attempt an operation that is not allowed. The machine will not understand what is required. It will do nothing, except give three bleeps.

The third case occurs when the machine is unable to autobalance. It will display a message to that effect and give three bleeps.

3.3.4 Keyboard Displays

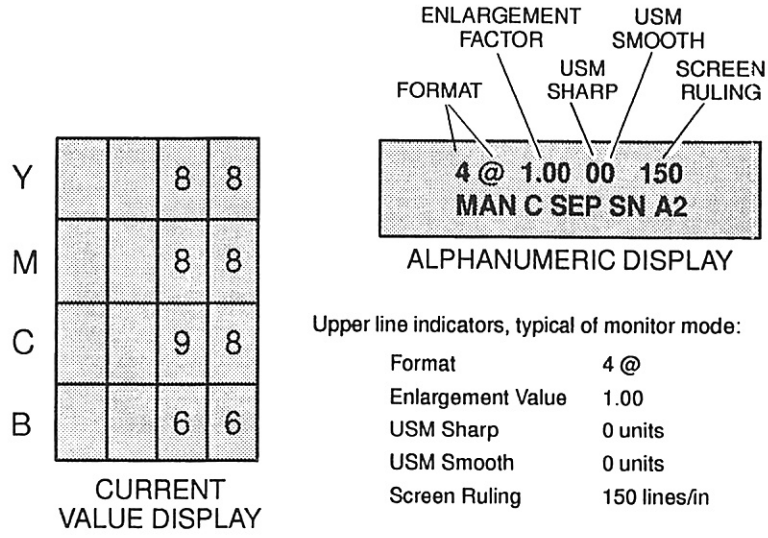


Figure 3.3 Analyse keyboard displays

The Alphanumeric Display shows the current state of the scanner or asks questions about entries that you may want to make. It will also display error messages.

The Current Value Display has one channel for each of the four printers, Yellow, Magenta, Cyan and Black. It displays values of

Original density if **[ORIG]** is pressed, or Separation dot % if **[SEP]** is pressed. The values, which are those for the area of the original or cylinder that would be seen in the centre of the view screen, are displayed in the four channels simultaneously.

3.3.5 Operator Control Buttons

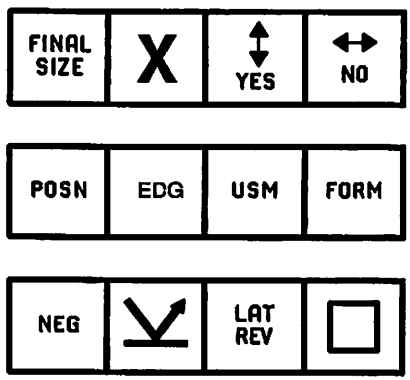


Figure 3.4 Operator control buttons

These buttons allow the operator to select facilities that affect the quality of the picture to be produced. Use of the buttons in conjunction with the numeric keypad will cause the Alphanumeric Display to change.

The **[FINAL SIZE]** button is used to enter the required separation size. The scanner will then calculate the enlargement value needed. Alternatively, this button can be used to enter the existing original size and what enlargement value is required.

The Enlargement button is used with the keypad to enter a required enlargement value. When **[FINAL SIZE]** is pressed, the scanner will calculate and display the separation size.

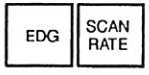
This button is used for two functions:

- To give affirmative answers to questions shown on the Alphanumeric Display.
- To select vertical dimensions with **[FINAL SIZE]**.

This button is used for three functions:

- To give negative answers to questions shown on the Alphanumeric Display.
- To select horizontal dimensions in conjunction with **[FINAL SIZE]**.
- To step through a series of displays. For example, when in the Tone or Neutral Tone mode, this button is used to step through the **HL**, **1/4**, **MT**, **3/4** and **SH** options.

The **[POSN]** button is used to select the start and end positions of the picture. It is used in conjunction with the analyse head.



The **[EDG]** button is used to enter the Electronic Dot Generation functions; screen ruling, dot shape, screen angles and output resolution. On some machines this button may be labelled **[SCAN RATE]**.

The Unsharp Masking button, **[USM]**, is used to select and display the required levels of USM, USM Sharp and USM Smooth.

The **[FORM]** button is used to select the separations to be exposed. It is used in combination with the Channel buttons, **[C]**, **[M]**, **[Y]** and **[B]** to select the colours when 2 up or 1 up options have been selected.

then

enables the screen angle/colour combination to be changed.

The **[NEG]** button is used to select positive or negative output separations:

Illuminated	=	negative separations
Not illuminated	=	positive separations.

This button is used to select reflection or transmission mode of operation:

Illuminated	=	reflection mode
Not illuminated	=	transmission mode.

The Lateral Reversal button, **[LAT REV]**, is used to select the direction in which the analyse carriage moves when scanning:

Illuminated	=	right to left
Not Illuminated	=	left to right.

When the button is not illuminated, a transparency that is mounted wrong reading, emulsion-up, will be scanned to give a separation which, when viewed emulsion-up, will be wrong reading. This is the normal mode of operation for offset litho.

This button is used in conjunction with the Cal button to exit from 'Queue from Scanner' when a Macintosh terminal is connected.

then

3.3.6 Channel Select Buttons

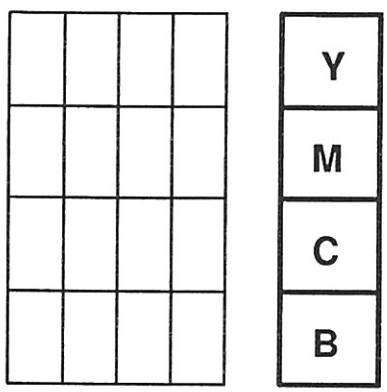


Figure 3.5 Channel select buttons

These four buttons are coloured to correspond to the colour of the separations, Yellow, Magenta, Cyan and Black. The buttons are selected individually so that you can enter reproduction characteristics for an individual channel.

3.3.7 Keypad Buttons

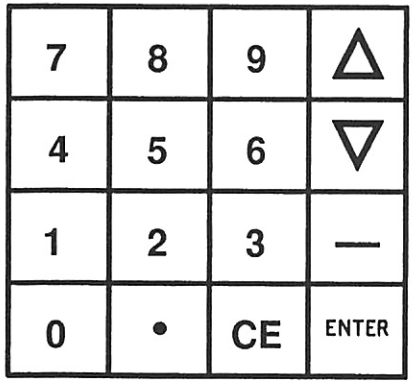


Figure 3.6 The keypad

All the buttons from 0 to 9, together with the decimal point and the minus sign, are used to enter numerical data into the scanner.

This button may be used to increase the effect of a selected Edit function, by raising the value of the Index number.

The button may also be used to step backward through a sequence of displays.

This button may be used to decrease the effect of a selected Edit function, by lowering the value of the Index number.

The button may also be used to step forward through a sequence of displays.

The minus button is used to enter negative numbers.

CE

The **[CE]** button is used to cancel any entry that has been selected by means of the keypad, provided that **[ENTER]** has not been pressed. It is also used to clear any error messages that may be displayed.

ENTER

The **[ENTER]**button is used to enter any data into the scanner. A successful entry is indicated by one bleep.

3

3.3.8 Editorial Control Buttons

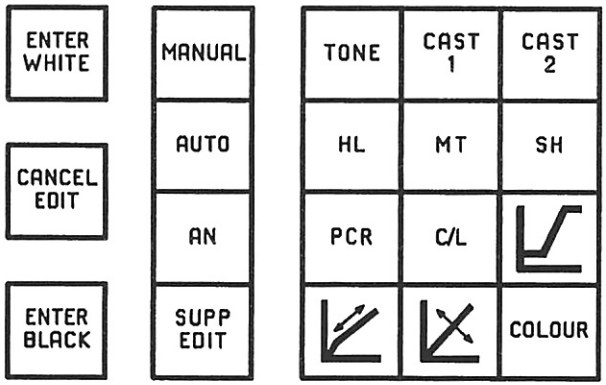


Figure 3.7 Editorial control buttons

End Densities

[ENTER WHITE], **[ENTER BLACK]**, **[MANUAL]**, **[AUTO]** and the Auto Neutral key, **[AN]**, are used to set the Highlight and Shadow starting points. The picture processing will be based on these two points. The scanner will determine the required tonal gradation between these points, according to instructions from the operator.

ENTER WHITE

The **[ENTER WHITE]** button is used to enter the first printing tone.

The **[ENTER BLACK]** button is used to enter shadow areas. Where there are no shadows, you can enter saturated colours.

The **[MANUAL]** button is used to enter an individual value for EW and/or EB in any of the three colour channels. The values in the other channels and the Black Printer will be adjusted automatically to give scanner facsimile at that entry point.

The **[AUTO]** button is used to enter preset values for EW and/or EB. The lowest channel is automatically selected and the remaining two channels are adjusted accordingly to obtain partial neutralization.

The Auto-Neutral **[AN]** button is used to enter preset values for EW and/or EB. The lowest channel is automatically selected and the remaining two channels are adjusted accordingly to obtain full neutralization.

Tone and Cast

The **[TONE]** button is used to make equal adjustments of the curves in all three colour channels, in Highlights, $^1/_4$ Tones, Midtones, $^3/_4$ Tones and Shadows, thus making particular parts of the tone range lighter or darker.

then : enables the Neutral Tone function.

then

: steps through the sequence of HL, $^1/_4$, M, $^3/_4$, SH for tone changes.

then **Y**, **M**, **C** or **B**

: enables the Channel Selective Boost function.

The **[CAST 2]** button differs from **[CAST 1]**:

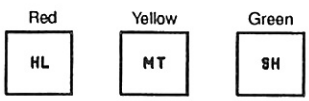
- It is neutral selective, i.e. has full effect on neutrals in the subject with no effect on saturated colours.
- It is only effective in Shadows (the **[SH]** button does not require selection).

[CAST 2] must always be selected before **[CAST 1]**.

The **[CAST 1]** button is used in:

- the Highlight and/or Mid Tone and/or Shadow areas
- the C and/or Y and/or M channels.

Cast can be corrected in one or two colour channels, e.g. in order to make an area neutral. However, cast correction can be made in all three colour channels if required.



The **[HL]**, **[MT]** and **[SH]** buttons are used to control highlight, midtone and shadow gradations respectively. Any one of these may be used after **[TONE]** or **[CAST 1]**.

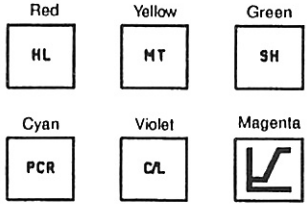
Colour

The **[COLOUR]** button is used to access the CC controls.

Press **[COLOUR]** again to exit from the CC mode.

then : enables the Pastel Boost function.

Colour Correction



These coloured buttons have dual functions and will only work as colour correction (CC) controls if the CC facility has been selected beforehand by pressing **[COLOUR]**. Otherwise, they operate according to the functions marked on their faces. The CC buttons are used to select colours in the original to be corrected.

Polychromatic Colour Removal

The **[PCR]** button is used to access the Polychromatic Colour Removal (PCR) facility.

Catchlight

The Catchlight button **[C/L]**, is used to get a highlight drop-out facility with variable Slope.

The Catchlight must be set using Breakpoint and Slope facilities.

Breakpoint

This button is used in the Breakpoint setting sequences for UCR and CL to view the current settings.

then : enables the Neutral Tone function.

COLOUR then : enables Enhanced Colour functions.

Slope

This button is used in the Slope setting sequence for UCR and CL to view the current settings.

COLOUR then : enables Pastel Boost functions.

Limit

This button is used to set dot % limits. This has the effect of cutting off the tones in a scanned film at a certain dot %. It is normally used for gravure.

Note: The Limits function should not be confused with Highlight Catchlight control or Shadow PCR control.

Edit

CANCEL EDIT

The **[CANCEL EDIT]**button lights up when Edit functions have been selected or entered into the scanner provided that the last used CV and JV are not equal. **[MANUAL] [ENTER WHITE]**, **[MANUAL] [ENTER BLACK]** and **[AUTO] [ENTER BLACK] do not** cause the button to light up.

If you press the **[CANCEL EDIT]** button you enter a routine which allows you to cancel some, or all, of the edits.

SUPP EDIT

The **[SUPP EDIT]** button is used to see what effect an Edit control is having. If there are no edits then this button suppresses the grey balance.

3.3.9 Scanner Control Buttons

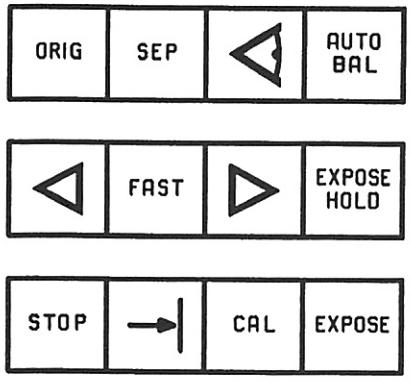


Figure 3.8 Scanner control buttons

Note: The name on the button marked Expose Hold may be different on certain machines as follows:
Load/Unload - AutoLoaders
Expose Hold - Combined Scanners.

These buttons are used to control various scanner operations.

The **[ORIG]**button is used to obtain densitometer readings. While the scanner is in the monitor mode it will operate as a densitometer. Point the analyse head at any part of the subject, and the scanner will display density readings for that area in the three colour channels on the Current Value Display.

The **[SEP]** button is used to change the Current Value Display from original density to separation dot %.

This button is used to change the scanner from the monitor mode to the view mode. This allows copy to be seen through the analyse viewer.

Pressing the button a second time returns the scanner to the monitor mode.

Note that if the scanner is in the view mode and no scanner keys are pressed for 11 minutes, the scanner will automatically return to the monitor mode.

The **[AUTOBAL]** button is used to prepare the scanner for the Autobalance function.

Autobalance is the automatic calibration and matching of the three input channels (similar to zeroing a densitometer). Clear cylinder represents minimum density, and an internal shutter, which cuts off the light to the photomultipliers, represents maximum density. An intermediate density is represented by the B patch neutral density filter, which is used automatically by the scanner during autobalance.

When the Current Value Display shows '-' in all positions, the scanner has not yet been autobalanced.

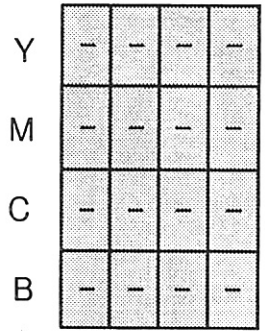


Figure 3.9 Current value display

Press this button to traverse the analyse head to the left. The speed will increase towards the maximum while the button remains pressed. To return to the slow speed, release and press again.

Press this button to traverse the analyse head to the right. The speed will increase towards the maximum while the button remains pressed. To return to the slow speed, release and press again.

The analyse head will traverse at the maximum speed when **[FAST]** is pressed together with either the Traverse Left or Traverse Right button.

The **[EXPOSE HOLD]** button is only used on combined scanners. It is used to prevent the carriage resetting to the scan-start position, after an expose sequence. Instead, the carriage advances a distance (set with **[CAL 34]**).

The next expose sequence can then be started to the right of the previous image, leaving a suitable gap between the two.

The Expose Hold function may also be selected or deselected automatically.

When used with a Macintosh terminal, this button will flash when a film change is required.

WARNING

This is not the emergency off switch.

This button is used to end all current operations, i.e.:

- when the scanner is exposing, **[STOP]** will stop the exposure and the scanner will return to the monitor mode (the expose head position is shown on the expose keyboard display)
- when the scanner keyboard is being used, **[STOP]** will cause the scanner to leave the current function, shown on the Alphanumeric Display, and return to the monitor mode.

This button is used to obtain the Cylinder Release or Datum Search functions. When pressed, either **CYLINDER RELEASE??** or **DATUM SEARCH??** is displayed.

If the operation is the one required, press **[YES]**.

If the operation is not the one required,

Press:

Press the Cylinder Release/Datum Search button again to display the other operation.

Press **[YES]** to start the required operation.

The **[CAL]** button is used in four ways:

- if followed by **[EXPOSE]** it selects the exposure of the electronically generated grey scale
- if followed by an entry of numbers from the keypad then **[ENTER]** it gives access to one of the scanner adjustment and calibration procedures
- if followed by it enables exit from 'Queue from Scanner' on the Macintosh terminal
- if followed by **[EXPOSE HOLD]** it downloads a job file from the scanner to the Macintosh terminal analyse queue (when the queue is under scanner control).

The **[EXPOSE]** button can be used to initiate the scan to an expose unit (a trade scan). In other cases the scan function is initiated from the Macintosh terminal.

During the expose sequence the Alphanumeric Display will show the percentage of the separation which remains to be scanned, (from 100% down to 0%).

Switching On and Off 4

This chapter describes the switching on and off procedures for the Celsis 6100 Scanners.

Reset procedures are described in Chapter 10.

4.1 Power-up

The Celsis 6100 Scanners MUST be switched on in the correct order, which is:

1. Expose units
2. Celsis 6100 Scanners and any other analyse units
3. Mac peripherals
4. Mac
5. SPARC peripherals
6. SPARC, Studio 9500, Studio HSI64 etc..

Note: If the expose unit is switched on after the analyse unit, it is likely to corrupt the analyse unit's memory. The usual symptom of this is a message on the analyse unit's alphanumeric display saying 'S STACK OVERFLOW'. If this happens, turn off the analyse unit **scanner** *switch, wait ten seconds, then turn it on again.*

For information on switching on other components of the system, please refer to the appropriate operator's manuals. Switch on the Celsis 6100 Scanners as follows:

1. Turn on the **LAMP** switch.
2. Turn on the **SCANNER** switch. The **SCANNER** switch is interlocked with the Xenon **LAMP** switch. It is impossible to switch on the general scanner functions before switching on the Xenon lamp.
3. Rotate the analyse cylinder through one revolution to set its angular position in the scanner computer.

Later on, you will need adjust the lamphouse optics and set the horizontal datum for the analyse head.

As the Job Value (JV) data is lost when the system is switched off, it is necessary to replace this data at power up. The system does this automatically by copying the Basic Values (BVs) or one of the Customer Values (CVs). The selection of the BV/CV used can be made using CAL 965, see Chapter 10, *Scanner BVs,CVs, JVs and Edits*.

4.1.1 Scanner Initialization

When a scanner is switched off, some information previously entered by the operator will be lost from the scanner memory. For example, JVs, original position values, final size values etc.. You will need to enter new information during job set-up. Unless and until new information is entered, the scanner will use the BVs which are permanently stored in its memory.

4.1.2 Analyse, Xenon Lamp

1. Remove the lower left-hand front panel from the analyse unit to gain access to the XLS.
2. Switch on the lamp as follows:
   a) Switch on the **LAMP** switch on the control panel.
   b) If not already on, switch the On/Off switch on the XLS panel to **I** (see Figure 4.1).
   c) Momentarily depress the **LAMP START** push-button switch on the XLS front panel. Do not keep switch depressed, as this may cause damage to the XLS.

The lamp starter will make a noise for about one second, after which the lamp should light. The indicator lamp should also light. If the lamp does not light, press the button again, after waiting at least five seconds. Repeat until lamp lights. Most lamps light the first time but some may require two or even three attempts, especially when cold and/or new. If the lamp fails to light, turn off the **LAMP** switch on the control panel. Check that the lamp is correctly fitted.

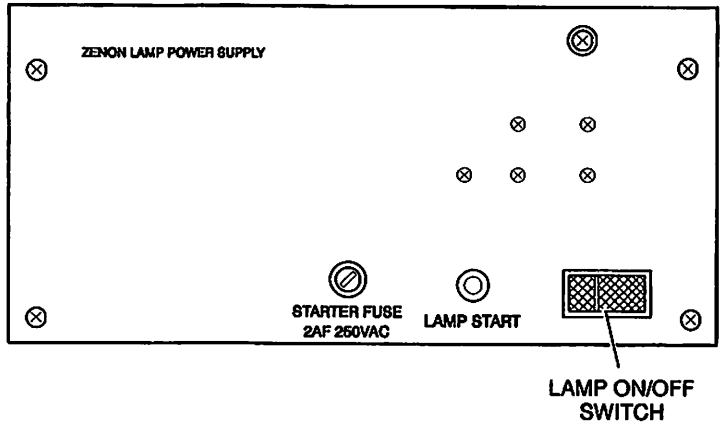


Figure 4.1 XLS front panel

4.2 Switching Off

The full power-down sequence for the analyse unit is as follows:

1. analyse, scanner switch
2. analyse, xenon lamp.

The xenon lamp should not normally be switched off unless it is to be left off for long periods. When leaving the scanner overnight and at weekends, reduce the light on the photo-multipliers. This can be done by:

- taping a 0.9 neutral density filter onto the cylinder, or
- selecting the most dense filter in the lamphouse.

If it is necessary to switch off the xenon lamp, set the **SCANNER** switch to off and then set the **LAMP** switch to off.

Analyse Cylinder and Optics 5

This chapter describes the procedures used:

- *to mount originals on the analyse cylinder*
- *to set up the optics in preparation for a scan.*

5.1 Removing the Analyse Cylinder

CAUTION

Ensure that the cradle is UP before releasing a SMALL CYLINDER, otherwise the cylinder may fall and be damaged.

1. Raise the cradle if necessary
2. Press:

   If

   is displayed,

   Press:

When **CYL RELEASE??** is displayed,

Respond:

Note that pressing: twice toggles between Datum and Cylinder Release.

A **CYLINDER ROTATING ?** message appears. If the cylinder is not rotating the operator must press **[NO]**.

CYL RELEASE is displayed.

The scanner bleeps six times and the carriage moves further to the right, releasing the cylinder from the hubs onto the cradle.

The carriage will move towards the right-hand limit.

3. Remove the cylinder from the cradle and transfer it to the loading table or return it to its box.

5.2 Cleaning the Cylinder

5.2.1 Cleaning Products

The outside of the cylinders should be cleaned using a solvent based on aliphatic hydrocarbons, for example:

Kami DC 2001

Source	:	Kami D91457 Markt Erlbach Germany
UK Agent	:	Kimoto U.K. Ltd 40a Jasmine Grove London SE20 8JP Telephone: 0181-659 1424

This item should be obtained from a local supplier, as it is not a Crosfield-supplied product.

If you cannot obtain the product listed above, other products of similar composition may be suitable. Do not use low molecular weight alcohols such as methanol or ethanol.

CAUTION

Other cleaning products may cause stress cracking in the analyse cylinder, making it unusable. They are used at your own risk.

5.2.2 Cleaning Procedure

WARNING

These solvents are highly flammable and must be used with care. Before handling, see Chapter 2.

Analyse drums must be removed from the scanner when cleaning is required. An exception may be made when only a small area of the drum is to be cleaned. In this case wet a tissue sparingly with solvent and apply it to the cylinder with care. Do not take the solvent container to the scanner.

A cylindrical lambswool-covered mop is provided for cleaning inside the small analyse cylinder. The recommended cleaning technique is to cover the head of the mop with a tissue moistened with cleaning fluid, push the mop up the cylinder and then repeat with a clean tissue for a final polish.

The effect of any static generated while the outside of the cylinder is being cleaned can be neutralized, using an anti-static brush such as the 'Static Master'.

5.3 Mounting Originals

5.3.1 Analyse Cylinders

Two sizes of analyse cylinder are supplied with Celsis 6100 Scanners. The smaller cylinder is used for enlargements of 75-3199% (2000% with guaranteed quality). The larger cylinder is used for enlargements of 20-800% and when you need the additional size of the larger cylinder because of the size or number of originals. Given the choice it will be more efficient to use the smaller of the two.

5.3.2 Preparation

The assessment of originals, especially transparencies, is never satisfactory if conducted with the transparency mounted on the cylinder. It should therefore be done before mounting them.

It is also important to make any scaling measurements with the original laid on a flat surface. Make these measurements before mounting the transparency on the cylinder.

When mounting multiple originals it is recommended that the originals are distributed evenly around the surface of the cylinder to improve dynamic balance and reduce vibration. This is particularly important when scanning reflection copy on the large cylinder. In some cases the Alphanumeric Display may show the message **A SPEED**, meaning that synchronous rotation has not been achieved.

If it is not possible to distribute the originals around the cylinder, place similar sized blank material on the opposite side of the cylinder to the original.

5.3.3 Mounting Transparencies

1. Clean the transparency with a small quantity of film cleaner applied to a soft lint-free cloth or soft tissue.
2. Set up the loading table for the large or small analyse cylinder. Move the roller handles to the outer position for the large cylinder or the inner position for the small cylinder.
3. Lift the transparency flap and lower the cylinder carefully onto the rollers.
4. Select the appropriate pressure roller and fit it to the roller shaft. Set the roller in one of the roller slots behind the cylinder - use the farther slots for the large cylinder and the nearer slots for the small cylinder.
5. Using the knob at the right-hand end of the mounting table, lower the pressure roller so that it is bearing against the cylinder.
6. Lower the transparent flap.

   Note: Tesa 4105 tape is recommended for use when attaching transparencies to the analyse cylinder. The tape is manufactured by Beiersdorf A.G., Hamburg, Germany.

7. For enlargements less than 350%:

   a) Use Anti-Newton Ring spray or powder and holding the transparency at arm's length from the nozzle of the spray, spray onto the side of the transparency that is to contact the cylinder. At the correct distance from the transparency, the spray nozzle will produce a finely grained matt covering on the transparency with no runs (it is advisable to practice with a spare piece of clear film or transparency beforehand, to ensure good results). Take care to ensure that no dust is impregnated in the spray covering.

   b) Fix self-adhesive tape along the top edge of the transparency. (See the note below.) Using the grid lines marked on the flap as a guide, align the transparency carefully with the cylinder. The alignment is particularly

important with large enlargements of small originals, as any small errors in alignment will be more obvious on the enlarged separation.

c) Apply self-adhesive tape to the trailing edge of the transparency and turn the cylinder so that the pressure roller rolls over the transparency and fixes it to the cylinder.

8. For enlargements of 350% or more:

a) Fix self-adhesive tape along the top edge of the transparency. Using the grid lines marked on the flap as a guide, align the transparency carefully with the cylinder. The alignment is particularly important with large enlargements of small originals as any small errors in alignment will be more obvious on the enlarged separation.

b) Place a spare piece of film 1 to 2 mm from the trailing edge of the transparency and tape the two together. Apply self-adhesive tape to the lower edge of the spare film. Do not butt the film to the transparency as this causes air bubbles to form.

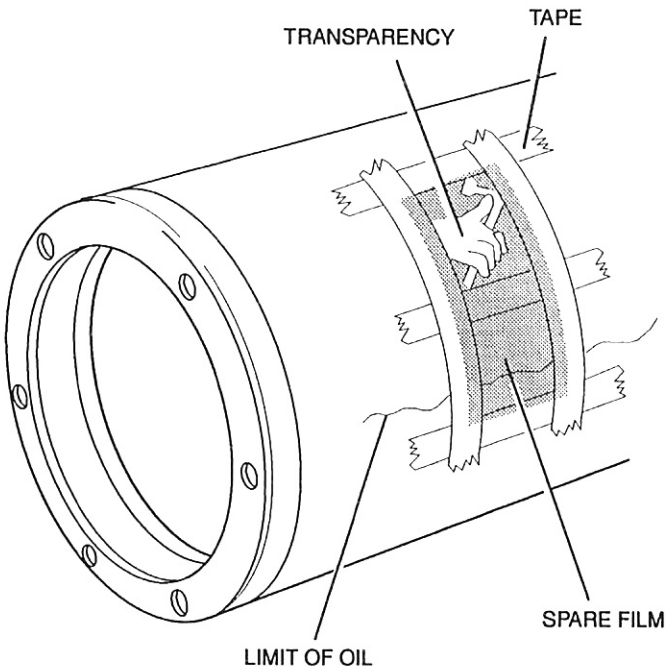


Figure 5.1 Mounting a transparency with liquid paraffin B.P.

CAUTION

Liquid paraffin may contain impurities which will cause stress cracking of the analyse cylinder. Always use a British Pharmaceutical grade or equivalent. Other grades are used at your own risk.

c) Lift the spare film and transparency and apply a small amount of liquid paraffin B.P. to the **middle of the**

leading edge. Turn the cylinder, allowing the pressure roller to squeeze out the excess oil. When the pressure roller is half-way over the trailing edge of the film, wipe away the remaining oil from underneath the film, using a tissue. Continue turning the cylinder past the film. Do not turn the cylinder a second time under the pressure roller.

d) Wipe the excess oil away with a tissue and check for dust, bubbles, etc. that may be trapped under the transparency. Clean the oil from the pressure roller, cylinder and transparency with a tissue moistened with solvent. (Suitable solvents are listed at the beginning of this chapter.)

e) Finally, apply adhesive tape to the side edges of the transparency, to prevent the oil from escaping when the cylinder is rotating.

Scratched Transparencies

The effect of scratches on a transparency can be reduced by mounting the transparency on liquid paraffin B.P. This is recommended in any case when making enlargements exceeding 350%, to eliminate Newton's Rings. The technique will be effective for scratches on the inner face of the transparency which lies next to the cylinder surface.

There are two ways to reduce the effect of scratches on the outer face of the transparency. The transparency may be overlaid with clear film, using more liquid paraffin. Alternatively, the operator can rub a little petroleum jelly carefully over the surface to fill the scratches, after the transparency has been mounted on the cylinder.

5.3.4 Mounting Reflection Copy

1. Set the loading table for use with the large analyse cylinder; roller handles out. The small cylinder is not recommended for reflection copy as it is difficult to ensure that the copy lays flat around the small diameter.
2. Lift the transparency flap and lower the cylinder carefully onto the rollers.
3. Select the appropriate pressure roller and fit it to the roller shaft. Set the roller into the farther slots.
4. Using the knob at the right-hand end of the mounting table, lower the pressure roller so that it is bearing against the cylinder.
5. Lower the transparent flap.

   Note: Tesa 4105 tape is recommended for use when attaching reflection copy to the analyse cylinder. The tape is manufactured by Beiersdorf A.G., Hamburg, Germany.

6. Fix self-adhesive tape along the top edge of the copy. Using the grid lines marked on the flap as a guide, align the copy carefully with the cylinder. The alignment is particularly important with large enlargements of small originals, as any small errors in alignment will be more obvious on the separations.
7. Cover the copy with a piece of transparent foil and secure the top edge of the foil to the cylinder.
8. Rotate the cylinder so that the copy and the foil are laid flat against the cylinder.
9. Secure the trailing edge with tape.

If Newton rings appear on scans, spray the surface of the copy with an Anti-Newton Ring spray before overlaying with the foil.

5.4 Loading the Analyse Cylinder

If the unit is already set up for the analyse cylinder size to be loaded, proceed to Step 9.

1. If the cradle is in the down position, put them upright. **When the cylinder is out, the machine will not traverse with the cradle down**.

2. Move the carriage to the left, so that the centre optics (scanning) lens can be reached.

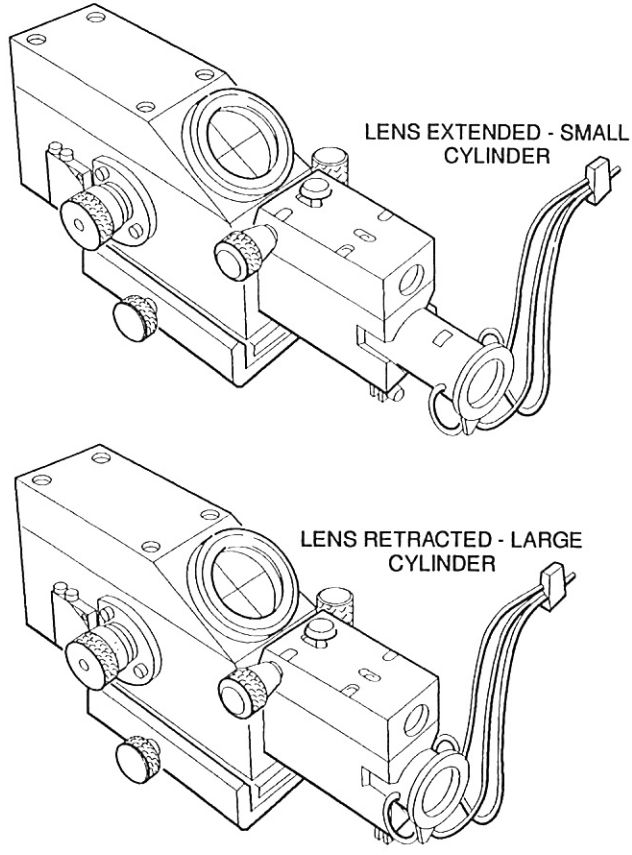


Figure 5.2 Analyse lens positions

3. If the analyse lens is in the forward position it must be retracted:

   a) Press the lens release button down and push the lens tube slightly backwards. Release the button.

   b) Continue to push the lens tube backwards until it locks in the retracted position.

4. Remove the scanning lens from the centre optics tube:

   a) With the left hand, pull the spring-loaded retaining pin at the end of the centre optics tube and hold it.

   b) Withdraw the scanning lens by sliding it out of its location. Place the scanning lens in its box.

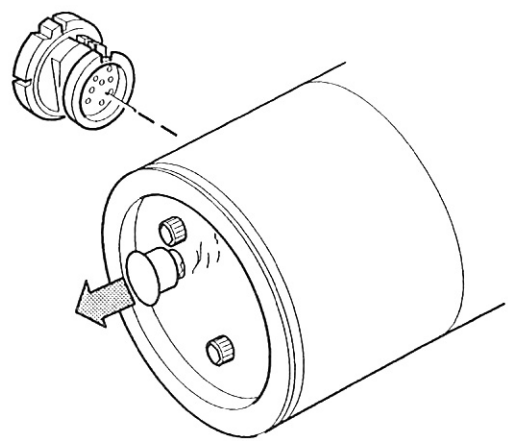


Figure 5.3 Scanning lens removal

5. Insert the other scanning lens or the blanking plug (used when scanning reflection copy). The lens used with the large cylinder is marked with an **L** and the lens used with the small cylinder is marked with an **S**.

   On the new lens you will see a shallow slot called a keyway, running down the barrel. This keyway locates on a pin inside the body of the centre optics tube.

Hold the lens by the collar with the keyway uppermost. Pull the retaining pin outwards and insert the lens. Gently push the lens into position (it may be necessary to rotate the lens a little to find the correct location) and release the pin when the lens is firmly seated.

If the the lens is correctly installed, it should now have only a small amount of rotational movement and it should not be possible to move the lens into or out of the centre optics tube.

6. If the small cylinder is to be loaded, move the analyse lens to the extended position.

   a) Press the lens release button down and pull the lens tube forwards, slightly. Release the button.

   b) Continue to pull the lens tube forward until it locks in the extended position.

7. Move the carriage to the right again so that the cylinder may be inserted.

CAUTION

Always check that the cradle is SECURE in the correct position, whenever its position is changed.

8. If the large cylinder is to be loaded, release the catch located on the right-hand rest and lower the cradle to the horizontal position.

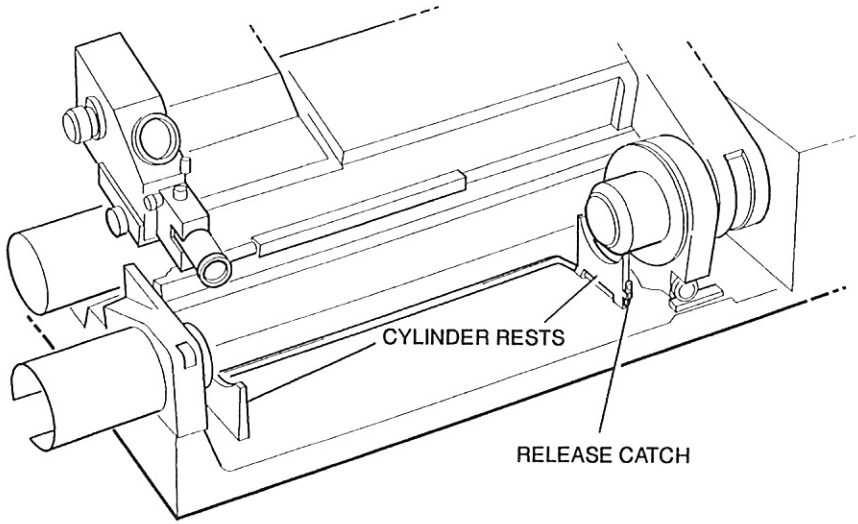


Figure 5.4 Position of rests for loading small cylinder

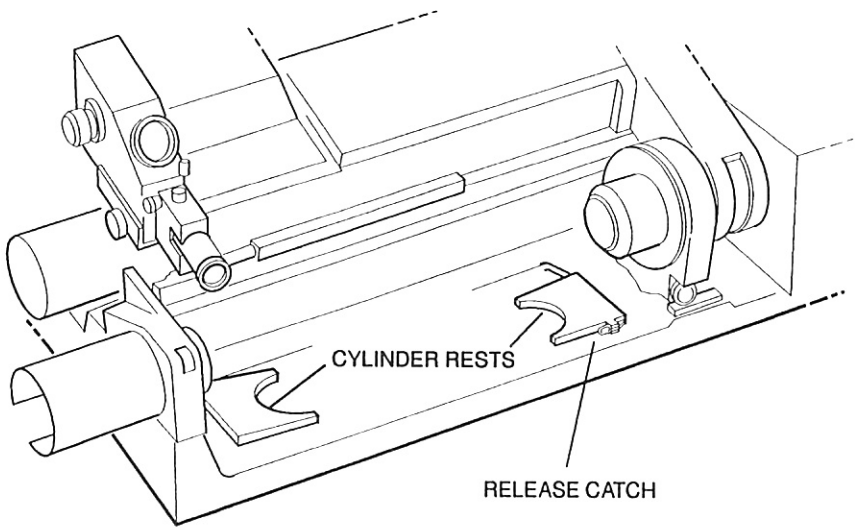


Figure 5.5 Position of rests for loading large cylinder

9. Place the cylinder onto the cylinder rests.

10. Turn the hub to line up the locating ball on the hub with the slot in the left-hand end of the cylinder. **Do not** turn the cylinder on its rests as this will damage the cylinder surface.

11. If the large cylinder is used position it so that its left-hand rim is within 4 mm of the sensor face, or the carriage will not traverse.

12. Check that the analyse lens is in the correct position for the new cylinder.

    A lens position sensor prevents carriage traverse if the large cylinder is loaded **and** the lens is in the forward position. A display appears:

    RETRACT LENS

13. To complete the loading of the cylinder:

    Press and Hold: ◁ and FAST

    The hubs will move towards the cylinder. Check that they engage the cylinder correctly, with the locating ball and pin seating properly in the cylinder slots.

5.5 Datum Search and Angular Position

A datum search is automatically performed when the system is switched on, and after a scanner reset. It must also be performed after loading an analyse cylinder:

Press: DATUM SEARCH?

Press:

DATUM SEARCH

The analyse head moves across the cylinder to the left-hand edge to complete the datum search.

Rotate the cylinder through one complete turn. The angular position has now been set.

The angular position must be reset:

- after powering up the system
- after loading an analyse cylinder
- after performing a scanner reset.

This is necessary to set its angular position in the scanner's computer.

5.6 Optical Procedures

5.6.1 Centering the Spot

Note: This procedure can only be carried out in transmission mode, but must be set correctly prior to use of reflection mode.

The following procedure must be performed every morning and whenever the analyse cylinder is changed. The procedure should also be performed periodically during the day.

Press: CRL

Enter: 40

Press: ENTER

The scan spot appears on the view screen. Use the horizontal and vertical adjusters to position the spot so that it is central on the crosswires.

Press: ENTER

Note: Do not try to centre the spot by observing minimum density readings. This can cause inaccurate alignment and colour tracking errors.

5.6.2 Switching Between Transmission and Reflection Light Paths

If changing between transmission and reflection copy it is necessary to select the appropriate light path:

Press:

When the button is lit the light path is set for reflection copy.

When performing automatic scan-sequences the light path will be set as specified in the Job File for each scan.

5.6.3 Setting the Focus

The focus must be checked on each image. It is particularly important when the analyse cylinder has been changed or the thickness of the original is different.

Press if necessary, and traverse the analyse head to view the original in the view screen.

Turn the analyse head focus adjuster to obtain sharp focus at the **centre** of the cross-hairs.

Press again to return to the monitor mode.

5.6.4 Setting the Aperture and Filter

Set the analyse aperture according to the Scanner Fact Chart (see Chapter 18). The aperture knob is at the rear left-hand side of the analyse head. The number of the aperture required should be adjacent to the red spot on the side of the analyse head.

Set the analyse filter according to the Scanner Fact Chart. The filter knob is at the rear right-hand side of the lamphouse. The number of the filter required should be adjacent to the white spot on the side of the lamphouse.

5

Resolution and EDG 6

This chapter describes the procedures used to view or change the output resolution and Electronic Dot Generation (EDG) settings.

If the image is to be output on non-Crosfield expose units or Crosfield expose units with their own EDG system, do not use the screen angle, screen ruling or dot shape functions described in this chapter. In these cases, please refer to the appropriate expose unit operator's manual. The scanning resolution must be specified in all cases.

6.1 Introduction

There are alternative procedures which can be used to specify the resolution and EDG parameters. When using Crosfield standard resolutions the quickest method is to use the **[EDG/SCAN RATE]** button functions. Alternatives are outlined later in this section.

6.1.1 Terminology

Figure 6.1 shows the meaning of vertical and horizontal output resolution. Figure 6.2 illustrates the meaning of screen ruling and screen angle.

6.1.2 Output Resolutions

The full range of resolutions available can be specified using **[EDG/SCAN RATE]** button functions. This method allows independent selection of horizontal and vertical resolutions if required. See Section 6.2.

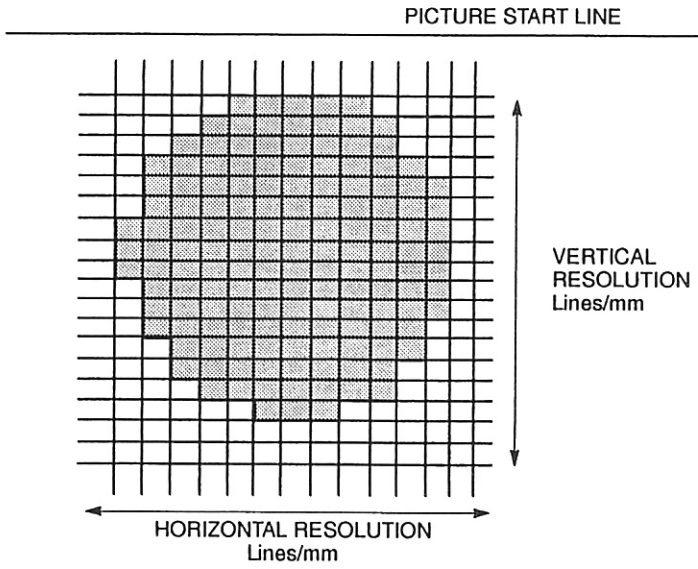


Figure 6.1 EDG output resolution

6.1.3 Screen Rulings

Screen rulings are set from within the **[EDG/SCAN RATE]** button functions. See Section 6.2.

Screen rulings can be viewed on the alphanumeric display in metric or imperial units. See Section 6.3.

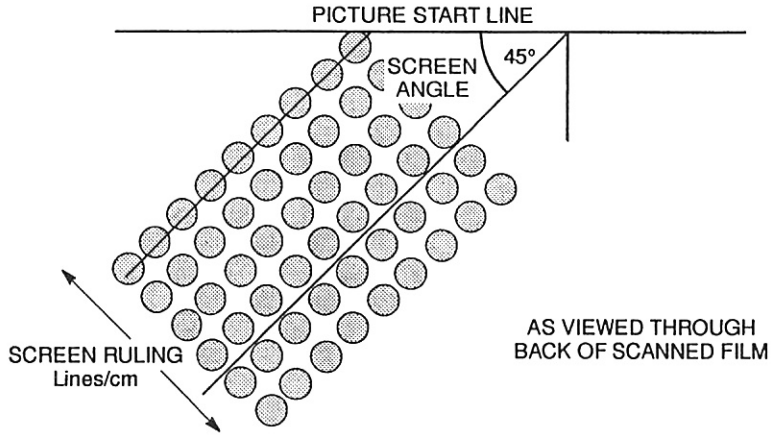


Figure 6.2 EDG screen ruling

Some typical screen rulings and their uses are listed below:

Screen Ruling		Examples of Use
lines/cm	lines/inch	
33 to 40	85 to 100	Newspapers
50 to 60	133 to 150	Medium quality offset
70 to 80	175 to 200	High Quality offset

6.1.4 Screen Angles

Screen angles are set from within the **[EDG/SCAN RATE]** button functions. See Section 6.2.

6.1.5 Dot Shape

There are two procedures that can be used to select the dot shape:

- Dot shapes can be selected from within the **[EDG/SCAN RATE]** button functions. See Section 6.2.
- Dot shapes can also be selected using CAL 701. This function is limited in that it is not possible to change the width/length proportions of elliptical dots. For more information on CAL 701, see Section 6.4.

6.2 Using EDG Button functions

The output resolution and EDG settings can be changed on a series of displays initiated by pressing the **[EDG/SCAN RATE]** button:

Press: SCAN RATE

The first display appears. To step through the other displays:

Press: ENTER or ▽

To exit from the sequence at any stage:

Press: SCAN RATE

6.2.1 Output Resolution

Any resolution between 4 and 49.9 l/mm can be specified. Horizontal and vertical resolutions can be specified independently.

The actual range of resolutions which you can use will depend on the expose unit. For example on Crosfield Autoloader and E/M Output Scan Stations, only 8, 12, 16, 24 and 32 l/mm are acceptable entries.

Metric (lines/mm)	Imperial (lines/inch)	Expose Aperture
8	203	1
12	305	2
16	406	3
24	610	2
32	813	3

The imperial specification is given for comparison. All entries must be made in metric units.

After pressing **[EDG/SCAN RATE]** the horizontal resolution setting is displayed:

To change the horizontal resolution, to 12 l/mm for example:

Enter: **12**

Press: ENTER

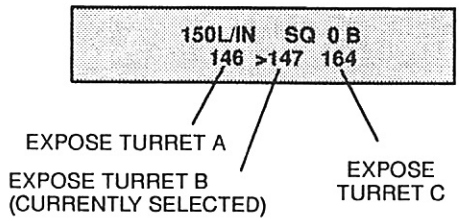
The new horizontal resolution is entered and the vertical resolution is displayed. This will be set to the same value as the horizontal resolution just entered, regardless of the previous setting.

If a different resolution is required, enter the new value and press **[ENTER]**. If no change is required, just:

Press: ENTER

The other **[EDG/SCAN RATE]** functions are only applicable to Crosfield Autoloader and E/M Output Scan Stations. If horizontal or vertical resolutions have been entered which cannot be used by these units the display will show:

If standard resolutions have been selected a different display will appear:

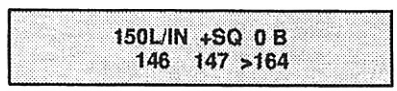


The screen ruling for the selected resolution is indicated by the position of the **>** in the bottom row of the display:

- If the **>** appears to the left of the bottom row 8 l/mm resolution and Expose Turret A will need selecting.
- If the **>** appears in the middle of the bottom row 12 or 24 l/mm resolution and Expose Turret B will need selecting.
- If the **>** appears to the right of the bottom row 16 or 32 l/mm resolution and Expose Turret C will need selecting.

To change the resolution step the **>** through the display using the **[NO]** button, i.e.

Press:



Press:

6.2.2 Screen Rulings

Suitable screen rulings are available for each angle code and resolution. Entry of a ruling in the display will result in the nearest possible ruling being displayed for the resolution (expose turret) currently selected. See Chapter 18 for a list of preferred rulings.

In the following example a value of 175 lines/inch is entered. With an Angle Set Code of 0 and Turret B specified, this value will be set to the nearest recommended ruling of 174 lines/inch:

```
150L/IN +RN 0 B
146 > 147  164
```

Enter: **175**

Press: ENTER

```
175L/IN +RN 0 B
146 > 174  172
```

If a screen ruling greater than 300 lines/inch (123 lines/cm) is entered, the angle code 0 will change to angle code 80. This is a fine-screen angle family, (Nominal x2) which uses the same angles as angle code 0.

6.2.3 Dot Shape

Four dot shapes are available:

Shape Code	Type
0	Square (**SQ**)
1	Elliptical (**EL**)
2	Round (**RN**)
3	Autotypical Gravure (**GV**)

To change the type selected, enter the code, i.e.:

```
175L/IN +RN 0 B
DOT SHAPE CODE;
```

If the elliptical dot option is selected an additional display will appear:

Enter: **1**

```
175L/IN +EL 0 B
BPNT= 60/ 40%
```

If no change is required, just press **[ENTER]** to step to the next display.

To change the Breakpoint enter either the higher or lower value. Breakpoints are illustrated in Figure 6.2. for example, to change to 75/25%:

Enter: **25**

Press: [ENTER]

To leave the Dot Shape display:

Press: [ENTER]

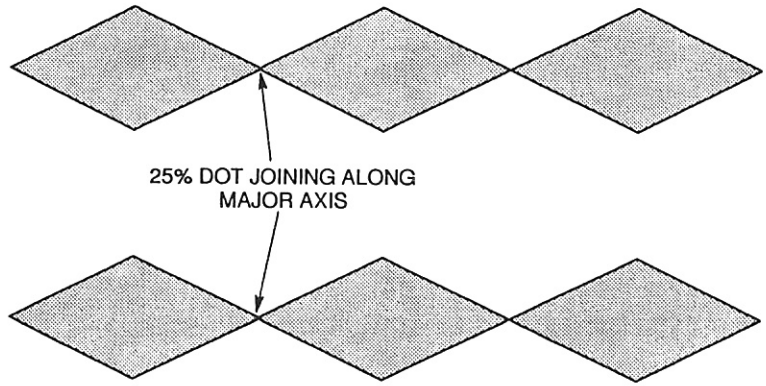
6.2.4 Screen Angles

A wide range of angle codes are available. These have been chosen to avoid moire occurring between colours. Each angle set is specified by entering a code. A full list of codes and their corresponding angles are presented in Chapter 18.

Angles can also be specified individually for each colour.

CAUTION

Moire may occur on exposed films if individual screen angles are changed.



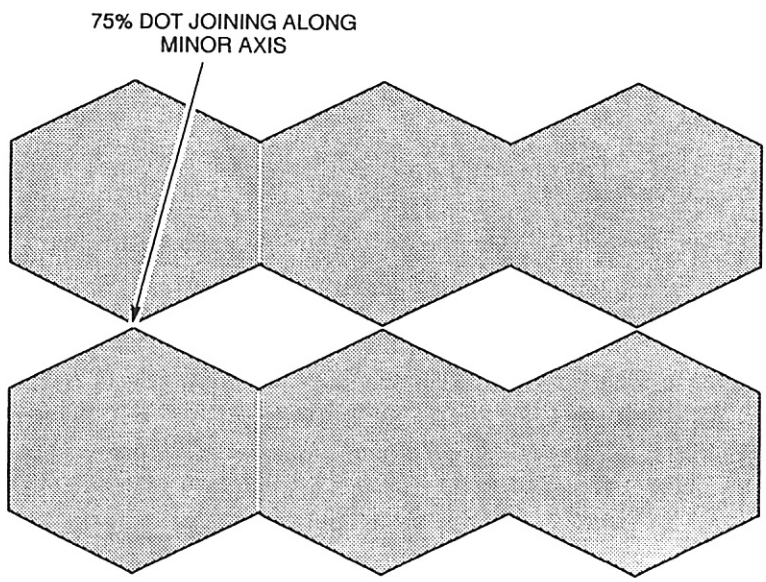


Figure 6.3 'Elliptical' dot with 75/25% breakpoints

To enter an angle code, i.e. code 11:

150L/IN +SQ 0 B ANGLE CODE ;

Enter: **11**

Press: ENTER

150L/IN +SQ11 B 146 > 147 164

The Alphanumeric display is updated and the new angles appear in the Current Values display:

Y			9	0
M			4	5
C			7	5
B			1	5

6.3 Metric or Imperial Screen Ruling

To change the displayed screen ruling data between metric and imperial units, use CAL 893. The current mode will be displayed:

Press: CAL

Enter: 893

Press: ENTER

IMPERIAL RULING
CHANGE YES/NO ?

To terminate the display, leaving the system in the mode currently displayed:

Press: ↔ NO

To change the mode:

Press: ↕ YES

METRIC RULING

After about two seconds the display returns to the monitor mode.

Note: The displayed numerical value for the screen ruling does not change when using this function. For example a screen ruling of 150 l/in will, after using CAL 893, be changed to 150 l/cm. The screen output to film will still be 150 lpi (87 l/cm), but the display will not be correct until after the screen ruling has been re-entered.

6.4 Selecting Dot Shape using CAL 701

This method of dot shape selection is is quicker than the **[EDG]** button method if dot shape is the only EDG change to be made. Its limitation is that the proportions of elliptical dots cannot be changed, and are not displayed.

Press: CAL

Enter: **701**

Press: ENTER

SQUARE DOT
SQ = 0 CHN = 1 RND = 2

The current dot shape is displayed on the top line. To change the selection:

Enter: **0** for square (**SQ**) dots

Enter: **1** for elliptical or chain (**CHN**) dots

Enter: **2** for round (**RND**) dots

Enter: **3** for autotypical gravure dots (option not displayed on bottom line).

After the entry the new dot shape appears on the top line. To exit:

Press: ENTER

Input Calibration 7

This chapter describes the input-calibration procedures. Autobalance and Enter White/Enter Black must be performed before each scan or sequence of scans. When using Autoscan software, Enter White/Enter Black may be performed automatically within the Autoscan sequence. See the CELSIS 6000 Macintosh User's Interface Manual, see Associated Documents at the beginning of this manual.

7.1 Autobalance

Autobalance is similar to zeroing a densitometer. In autobalance mode the clear cylinder represents minimum density and no light to the photomultipliers represents maximum density.

Autobalancing should be performed at regular intervals and is essential after:

- changing the cylinder
- changing the scanning lens
- changing the focus
- changing the aperture.

7.1.1 Operation

Autobalance proceeds automatically once it has been started. Set the analyse head to view a clear area of the analyse cylinder.

Whenever you autobalance, the correct cylinder, aperture, lens and focus etc. must be selected for the work to be done.

Transmission Autobalance Sequence

When the Current Value Display shows '-' in all positions, the scanner has not yet been autobalanced.

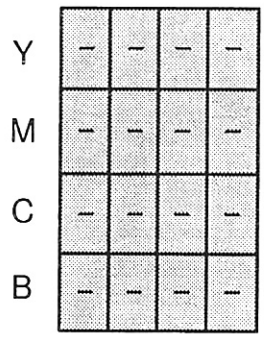


Figure 7.1 Current value display

7

To autobalance Celsis 6100 Scanners do the following:

1. Check that the illumination is set in the transmission mode.
2. Check that the correct centre optics lens (S or L) is fitted.
3. Check that the analyse lens is set in the correct position.
4. Check that the scan spot is central using CAL 40.
5. Set the focus on the job to be scanned.
6. Clean the area of cylinder to be used.
7. Aim the analyse head at the clean area.
8. Set the aperture.

9. Press: AUTO BAL → AUTOBALANCE Y/N ?

10. Press: ↕ YES

Reflection Copy Autobalance Sequence

1. Check that the illumination is set in the reflection mode.
2. Check that the centre-optics blanking-plug is fitted.
3. Check that the analyse lens is set for the large cylinder.
4. Set the focus on the job to be scanned.
5. Place the white autobalance patch from the Repropack on the cylinder.
6. Aim the analyse head at the patch.
7. If you are operating in the manual aperture mode, only the aperture currently selected will be Autobalanced. You must therefore set the aperture before Autobalancing when operating in this mode.

8. Press: AUTO BAL → AUTOBALANCE Y/N ?

9. Press: ↕ YES

7.1.2 Autobalance in Action

During Autobalance the numbers in the Current Value Display fluctuate rapidly between high and low values. The Alphanumeric Display will fluctuate between:

AUTOBAL WHITE APERTURE 1	AUTOBAL BLACK APERTURE 1
AUTOBAL WHITE APERTURE 2	AUTOBAL BLACK APERTURE 2
"B" PATCH TRACK	

A correct autobalance will be indicated by one bleep and the Alphanumeric Display will revert to the monitor mode, indicating that normal operation may continue. An incorrect autobalance will be indicated by three bleeps. The Alphanumeric Display will show a message like this:

TRY AGAIN Y/N
ERR WC B= Y

W:C = White autobalance error in cyan channel.

B:Y = Black autobalance error in yellow channel.

You now have two options.

To autobalance again:

Press:

To exit autobalance routine:

Press:

The scanner will revert to the normal monitor mode but the error will remain.

If an error W or B results after a second attempt at autobalance, proceed down the following list until the problem is found:

1. Check that the correct analyse aperture is selected.
2. Check that the correct analyse filter is selected.
3. Check that the analyse lens is in the correct position for large or small cylinder.
4. Check that the analyse spot is centered (CAL 40).
5. Check that the analyse focus is sharp on a typical sample of copy (this is to ensure that the analyse focus is not drastically out).
6. Check that the correct centre-optics-tube lens is selected.
7. Check that the transmission/reflection mode is correct.
8. Check that the area of cylinder viewed (transmission) is clean.
9. Check that the white autobalance patch (reflection) is clean.
10. Clean centre optics and analyse lenses.
11. Check that the maximum light output is achieved by use of the lamphouse controls.

Assuming that none of the above checks have identified a problem, there are two other reasons for failure to autobalance.

- Insufficient light is reaching the analyse head, giving an Error White autobalance.

  Attempt autobalance several times more. If unsuccessful, after going through all the checks, fit a new Xenon lamp (see Chapter 16 for instructions).

- An electronic fault may be causing the lamp or other parts of the scanner to malfunction, affecting both white and black autobalance.

- Re-set scanner (CAL 900) and retry.

  Call the service engineer.

7.2 Recalling Autobalance Targets

Autobalance targets are used to match your scanner to other scanners or densitometers. A set of targets are stored as basic values but nine additional sets can also be stored.

After power-up or a reset the basic-value autobalance targets will be recalled. If you wish to use any other set of targets it will be necessary to recall them as described below.

The procedure used to obtain and store alternative autobalance targets is outside the scope of this manual. For information please refer to your Crosfield representative.

7.2.1 Procedure

To recall autobalance targets use CAL 152:

1. Press: CAL
2. Enter: **152**
3. Press: ENTER — RECALL ABAL NUMBER 0-9
4. Press: The set of targets (**0-9**) you want to recall.

7.3 Enter White and Enter Black

The Enter White, Enter Black (EW/EB) procedure is used to calibrate the scanner for the highlight and shadow end-points of the original.

*Note: Enter White (EW) and Enter Black (EB) functions must be set **before** the editorial non-facsimile controls are used.*

There are two methods used to specify the EW/EB values:

- In most cases entry is achieved by positioning the analyse head at the appropriate area of the original and performing an EW or EB procedure.
- As an alternative the EW and EB densities can be entered on the keyboard using CAL 28 and CAL 29 respectively. This method is useful when short range originals are to be scanned (having no highlight or no shadow region). It is also used when special effects are required or to speed the scanning process for a series of similar transparencies.

There are three modes which can also be selected. These allow the option of colour cast correction in highlights or shadows. Different options can be selected for EW and EB within the same image:

- The Manual mode gives scanner facsimile reproduction.
- The Auto mode operates in a similar way to Manual but provides partial neutralization of casts in highlights and shadows.
- The Automatic Neutral mode also operates in a similar way to Manual but provides total neutralization of casts in highlights and shadows.

Note that Grey Balance is applied to all output dot %. This is an automatic facility which compensates for deficiencies in inks, etc.. The effect that Grey Balance has on dot % is to reduce M and Y signals. This should be remembered when assessing the results of any EW or EB procedure.

The Black Printer is produced automatically by operation of EW or EB with a colour channel selected. However, further procedures are available to make adjustments to the Black Printer curve. These are described in Chapter 13.

7.3.1 Manual Enter White

When the scanner is in the original density (**ORG**) mode, with the analyse head aimed at the first printing tone, the current value display will give the density values for Y, M and C as seen by the scanner.

Select the lowest channel from Y, M and C (not B). Enter the dot % required in that channel. The remaining two channels will be automatically adjusted to give scanner facsimile at that entry point.

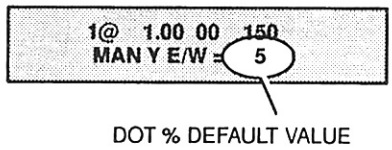
It is not essential to select a dot % to enter for that point. The scanner will enter a default value in the channel selected if no keypad entry is made.

In the following procedure it is only necessary to select the colour channel (**[Y]**, **[M]** or **[C]**) and mode (**[MAN]**, **[AUTO]** or **[AN]**) if they are not already selected.

Select the lowest channel (**[Y]**, **[M]** or **[C]**):

Press: MANUAL

Press: ENTER WHITE



Press: ENTER

Select the lowest channel from Y, M and C (not B). Enter the dot % required in that channel. The default value is a pre-programmed EW value. The value relates to the standard dot % for the first printing tone. The default value can be overridden, using the keypad, as follows:

Select the lowest channel (**[Y]**, **[M]**, or **[C]**) and enter the dot % required in that channel.

Press: MANUAL

Press: ENTER WHITE

```
1@  1.00 00  150
MAN Y E/W =   5
```

Enter: **n** This dot % value overwrites the default value and is retained.

Press: ENTER

If the **[B]** channel is selected a manual EW will be allowed and the black separation altered, with no effect on the **[Y]**, **[M]** or **[C]**.

7.3.2 Automatic Enter White

AUTO EW will always change the HL values of copy so that any cast is partially removed. It differs from MAN EW in that Y, M, C do not have to be selected, but the default and keypad procedures are the same.

AUTO EW always selects the lowest channel and deposits the default value or a keypad value in that channel. It adjusts the two remaining channels accordingly to give partial neutralization of any cast.

To obtain the default value:

Press: AUTO then ENTER WHITE then ENTER

To change the value:

Press: AUTO

Press: ENTER WHITE

```
1@  1.00 00  150
AUT C E/W =   5
```

Enter: n This value overwrites the default value and is retained.

Press: ENTER

7.3.3 Automatic Neutral Enter White

Automatic Neutral Enter White (AN EW) will always neutralize any HL cast. If there are already visual neutral tones in the picture, use of AN EW to remove a cast will cause those neutrals to be rendered non-neutral and will partially neutralize pastel tones. AN EW is effectively a 'two-button' control for cast removal to give facsimile as you may expect a neutral to appear.

AN EW reduces the tone in the two highest channels so that all three channels are the same value, and then applies GB. The value chosen is either the default value or an operator value entered via the keypad. The value will appear in the display's C channel after entry. If you suppress GB, all three channels will have the same value (Use **[Supp Edit]** when no edits are being used, to display dot % without GB).

To obtain the default value:

Press: AN then ENTER WHITE then ENTER

To change the value:

Press: [AN] then [ENTER WHITE]

Enter: **n** This value overwrites the default value and is retained.

Press: [ENTER]

7.3.4 Manual Enter Black

For scanner facsimile, when C channel is the highest original density for the SH aim point:

Press: [MANUAL] then [ENTER BLACK]

Select: [C]

Press: [ENTER]

The other two channels are automatically adjusted and all channels are grey balanced.

As in MAN EW, there is a default value for MAN EB, which can be overridden using the keypad.

7.3.5 Automatic Enter Black

AUTO EB should be used when Y or M channels are highest in order to achieve scanner facsimile (remember, it was MAN EB when C channel was highest). AUTO EB will deposit the default

value or the keypad value in the highest channel regardless of which channel is selected, other than Black (B).

BLACK must not be selected when setting AUTO.

The other two colour channels are adjusted accordingly and all channels are grey balanced. The Black Printer is automatically adjusted but may be altered using MAN B after Y, M, C, EW and EB are set.

To obtain the default value:

Press: [AUTO] then [ENTER BLACK] then [ENTER]

To change the value:

Press: [AUTO] then [ENTER BLACK]

Enter: n This value overwrites the default value and is retained.

Press: [ENTER]

7

7.3.6 Automatic Neutral Enter Black

Automatic Neutral Enter Black (AN EB) will always neutralize any SH cast. All of the colour channels are brought to the same value and then grey balanced. This can be compared to an operator looking at copy and seeing a brownish, bluish, greenish shadow etc. which in graphic arts terms would be produced as black, with the C, Y, M balanced to provide that effect. AN EB neutralizes shadow areas, not coloured areas. It is neutral-selective.

Any area that is neutral before use of AN EB will be rendered non-neutral after AN EB. Also, when neutralizing for example, a dark green shadow, other very dark greens will be neutralized or

partially reduced in greenness, but a medium-tone green area will not be affected.

To give a totally neutralized result at the SH end:

Press: [AN] then [ENTER BLACK] then [ENTER]

Use of a keypad entry of AN EB is not recommended. Either the scanner will disregard the keypad entry or tone distortion will occur.

7.3.7 Auto Enter White Correction (CAL 27)

CAL 27 determines how much the Auto EW corrects an existing cast:

Press: [CAL]

Enter: **27**

0.00 gives no neutralization
1.00 gives complete neutralization.

Enter the value you require and:

Press: [ENTER]

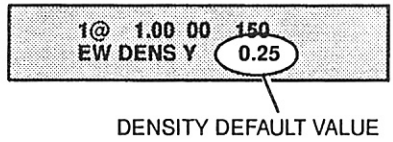
This function is stored using CAL 220 and recalled using CAL 120.

7.3.8 EW Procedure (CAL 28)

Press: [CAL]

Enter: **28**

Press: ENTER



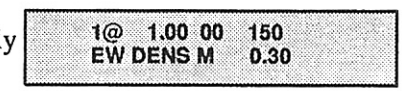
To change the EW density value on the yellow channel, to 0.30 for example:

Enter: **.3**

Press: ENTER

or to step to M:

Press: ENTER only



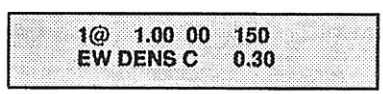
To change the EW density value on the magenta channel, to 0.28 for example:

Enter: **.28**

Press: ENTER

or to step to C:

Press: ENTER only



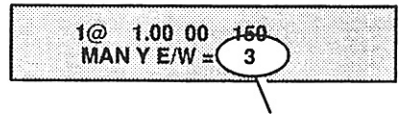
To change the EW density value on the cyan channel, to 0.32 for example:

Enter: **.32**

Press: ENTER

or to step on, just:

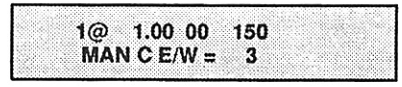
Press: [ENTER]



The display is now ready for the entry of the dot % value which is to correspond to the EW density. Only one channel can be selected.

To select the cyan channel, for example:

Press: [C]



To change the dot % value, to 5% for example:

Enter: **5**

Press: [ENTER]

The last-used values for HL aim points are stored in scanner memory. These values will be used for subsequent jobs until you enter new values.

7

7.3.9 EB Procedure (CAL 29)

Press: [CAL]

Enter: **29**

Press: [ENTER]

The button/display sequences for EB entries are similar to those for EW but note that when entering a density such as 3, it is

necessary to enter the decimal point and the first decimal value (3.0 not just 3).

The last-used values for SH aim points are stored in scanner memory. These values will be used for subsequent jobs until you enter new values.

7.3.10 'Two-button' Scanner Operation

Manual (MAN) entries can be made for any channel, but to achieve a 'two-button scanner facsimile' result:

Press:

Select lowest channel,

Press:

then

Select Cyan (highest channel),

Press:

then

Any MAN entries for a Y, M or C shadow value can be made provided that the appropriate channel is selected. The other two channels are adjusted automatically according to their original (ORIG) density relationship to the channel selected.

7.4 Colour Negative Scanning

CAL 530 toggles the scanner input settings between those for positive originals, and those for negative originals.

Scan Area and Enlargement 8

This chapter describes:

- *the setting up of the original start and finish co-ordinates*
- *the specification of enlargement or distortion of the output image*
- *analyse carriage functions*
- *the datum search procedure when the scan position is lost.*

8.1 Entering the Scanning Area Co-ordinates

8.1.1 Introduction

You must enter the start and finish co-ordinates on each original. These co-ordinates will then be used by the scanner to determine the rectangular scan-area. This procedure is referred to as cropping.

The datum reset procedure, described in Chapter 5, specifies the horizontal datum point. Similarly the manual rotation of the cylinder allows the scanner to find the vertical datum point. The scanner uses these parameters as reference data when making positional calculations.

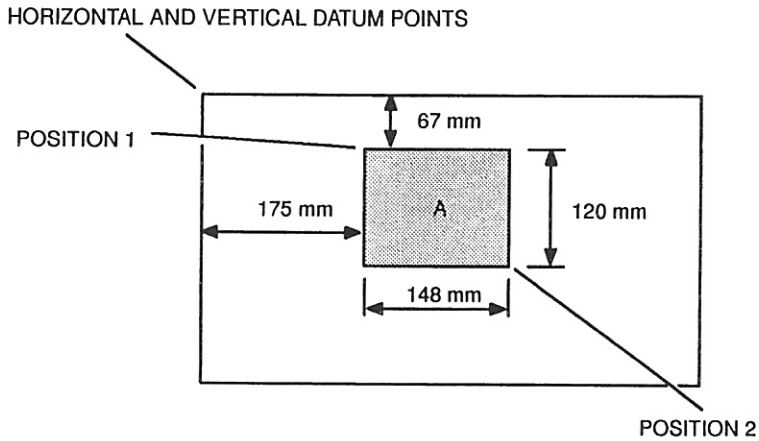


Figure 8.1 Analyse cylinder datum lines and position parameters

The large rectangle in Figure 8.1 represents the analyse cylinder as it would appear if it were opened out and laid flat. The horizontal and vertical datum points are indicated. The inner rectangle, A, represents the area to be scanned (148 x 120 mm in this example). The scan start position is indicated as Position 1 and the scan stop position is indicated by Position 2.

8.1.2 Entering Co-ordinates

To enter the start and finish co-ordinates:

1. Point the analyse head at the corner of the required area corresponding to Position 1 of Original A in the Figure 8.1.

   - Use [▷], [◁] and [FAST] as required for horizontal alignment.
   - Rotate the cylinder for vertical alignment.

To make it easier to find a point on a transparency using the view-screen, lines are engraved around the circumference of the outer and inner faces of the diffuser in the centre-optics tube. The outer line is red and the inner line black.

a) Without the aid of the view-screen, align these two lines and the horizontal image position on the original.

b) Rotate the analyse drum to bring the required point on the original within the area of the view-screen.

c) Fine alignment can then be made.

2. Press: POSN

```
4@ 1.00 00 150
1 V 67.0 H 175.0
```

The co-ordinates for Position 1 of Original A now appear as shown on the lower line of the Alphanumeric Display. They are specified to the nearest 0.1 mm.

3. To enter Position 1 of Original A:

Press: ENTER

```
4@ 1.00 00 150
2 V .0 H .0
```

The display now shows **2** instead of **1** on the lower line. The zero values for **V** and **H** indicate that you are still pointing the analyse head at the entry point for Position 1.

4. Using the same procedures as in Step 1 point the analyse head at Position 2 of Original A.

The second line of the display now shows the co-ordinates of Position 2 of Original A relative to Position 1:

```
4@ 1.00 00 150
2 V 120.0 H 148.0
```

These dimensions also represent the size of the input scan.

5. To enter Position 2:

   Press: [ENTER]

   The display returns to the monitor mode.

8.1.3 Correcting Entries

If you pressed **[ENTER]** when the analyse head was pointing at the wrong position, correct as follows:

Position 1 Error

Press **[ENTER]** to exit from the Position mode, then press **[POSN]** to re-enter the Position mode. Re-enter both Position 1 and Position 2.

Position 2 Error

1. Re-enter Position mode:

   Press: [POSN]

   Enter: **2**

2. Align the analyse head with the new Position 2.
3. To enter Position 2 co-ordinates and exit from the Position mode:

   Press: [ENTER]

8.2 Lost Position and Datum Search

The analyse unit may occasionally lose the position of the analyse head along the cylinder. This will be indicated by one of three symptoms:

- When selecting Position 1, the operator may notice that the **H** figure is obviously incorrect.
- When the **[EXPOSE]** button has been pressed, the Alphanumeric Display may read **POSN ENTRY ERROR**. This message is also shown if enlargement and/or position is more than the expose film area permits.
- The separations produced may not correspond to the area of original selected by the operator.

To remedy this condition use Datum Search to re-set the carriage position counter. It is controlled by the Cylinder Release/Datum Search button.

Press: CYL. RELEASE ?

Press: DATUM SEARCH ?

Press: DATUM SEARCH

The analyse carriage will then move to the far left and find its starting (or datum) position.

After datum search, rotate the analyse cylinder through one complete turn, to reset the cylinder position counter.

Re-enter the position of the original.

8.3 Setting the Size of Separations

Having selected the area to be scanned you must now determine the size of the separations. There are two methods. You can set either enlargement or final size.

8.3.1 Enlargement Method

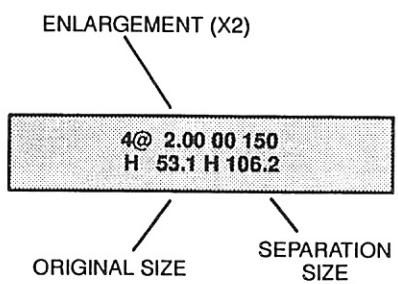
When the required enlargement value is known:

Press: [X]

Enter: **nn.nn** (where **n** is a decimal digit).

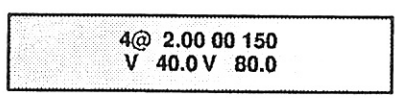
To check the horizontal dimension:

Press: [FINAL SIZE]



To check the vertical dimension:

Press: [↕ YES]



If this final size is suitable:

Press: [FINAL SIZE] again to return to the monitor mode.

8.3.2 Final Size Method

This method is used when you know the final separation size (output size) required, but not the enlargement value. You have already entered **[POSN]** to define the size of the original to be scanned (input size).

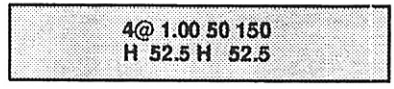
You can define the final separation size using its horizontal dimension or its vertical dimension. Whichever dimension is used, the scanner will compute the other dimension to give the enlargement value. If different enlargement values for horizontal and vertical dimensions are then required, the picture distortion facility CAL 33 must be used. (See Section 8.4.)

Input and output sizes are displayed together to the nearest millimetre. For maximum output dimensions accepted by the expose units, refer to the appropriate operators manual.

Final Size from Horizontal Dimension

In this procedure the enlargement is obtained by entering the required horizontal size of the output image:

Press: FINAL SIZE



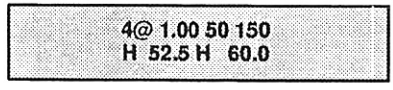
The first number is input size, the second is output size.

To retain this final size and return to the main display:

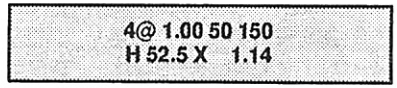
Press: FINAL SIZE

To change the final size, to 60 mm for example:

Enter: **60**



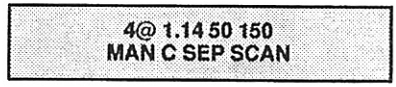
Press: ENTER



The scanner calculates and displays the new enlargement value, for your approval.

To retain this value:

Press: ENTER

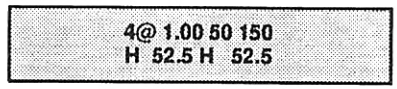


The scanner has accepted the new enlargement value and has returned to monitor mode. If **[FINAL SIZE]** is pressed again output size will be displayed as 60.0.

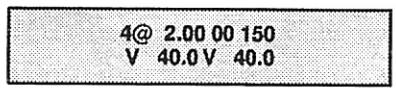
Final Size from Vertical Dimension

In this procedure the enlargement is obtained by entering the required vertical size of the output image:

Press: FINAL SIZE



Press: YES



The display has changed to show input and output **vertical** dimensions. The remainder of sequence is similar to the horizontal dimension method.

8.4 Picture Distortion

Sometimes the original has not got the necessary proportions to produce the required final size. For instance, you may have a square input but require a rectangular output.

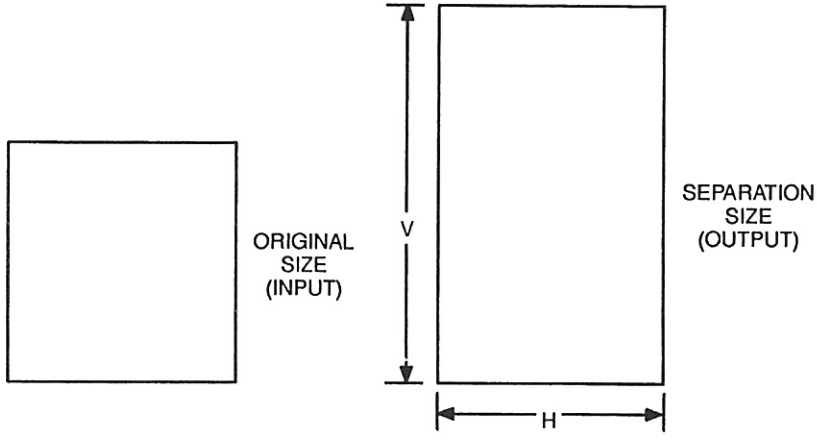


Figure 8.2 Picture distortion

In this instance, CAL 33 allows you to enter one enlargement value corresponding to the horizontal dimension (H), and a different enlargement value corresponding to the vertical dimension (V).

If you do not know the horizontal or vertical enlargement values, these can be found by entering the final sizes as described in Section 8.3. Note the **X** values which appear in the final displays.

8

Press: CAL

Enter: **33**

Press: ENTER

HORIZONTAL
ENLARG. ? 1.38

If this current value is the one you require for horizontal enlargement:

Press: ENTER

If you wish to change the value, for example to 1.14:

Enter: **1.14**

Press: ENTER

```
VERTICAL
ENLARG ?  1.25
```

The vertical enlargement is now shown on the display.

If required, you can now change the vertical enlargement, using the same method. When ready:

Press: ENTER to return to the monitor mode.

After leaving CAL 33 the top line of the display will show the horizontal enlargement. An * will also appear if the horizontal and vertical enlargements are not the same:

```
4@  1.38  00 150 *
MAN B ORG SN A2
```

8.5 Micro-enlargement

8.5.1 Changing Micro-enlargement

Micro-enlargement is only possible when the enlargement factor is set between 20 and 600%.

To view or change micro-enlargement settings:

Press: CAL

Enter: **39**

Press: ENTER

To change the vertical micro-enlargement enter the modifier, **-nn** for a reduction in size or **nn** for an enlargement. Entries from -128 to 127 are permitted. Beyond this range corruption will occur. The default value is zero. A correction factor of 1 unit is equivalent to a 0.1% change in enlargement. For example, to reduce the image size by approximately 1.2%:

Press: —

Enter: **12**

To confirm the current vertical micro-enlargement:

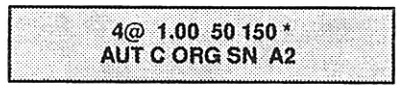
Press: ENTER

If required, enter the new horizontal micro-enlargement modifier in the same form as the vertical modifier.

To confirm the setting as displayed:

Press: ENTER

The system returns to the monitor mode. An * appears on the display if the enlargement modifiers in the vertical and horizontal directions are not the same:



8.5.2 Using Micro-enlargement to Compensate for Base Thickness Differences

The accuracy of the final size relies on the synchronization of the surface speeds of the analyse and expose cylinders.

When a transparency (mounted emulsion up) or reflection copy of 0.1 mm (4 thou inch) base thickness is scanned to a film which also has a base thickness of 0.1 mm, the original and scanned images will be the same size.

However, reflection-copy base thickness often exceeds the output film size. The analyse speed at the image surface will then be greater than the expose speed on the emulsion. The vertical size of the exposed image will be a little smaller than the original.

Although this slight distortion is not always important when scanning graphic images, it is often critical when input scanning text. Any inaccuracies can be overcome by using the micro-enlargement facility to adjust the vertical size.

Thickness Diff (mm)	Thickness Diff (thou Inch)	Micro-enlargement
0.12	4.6	+1
0.23	9.1	+2
0.35	13.7	+3
0.46	18.3	+4
0.58	22.8	+5
0.70	27.4	+6
0.81	32.0	+7
0.93	36.5	+8
1.04	41.1	+9
1.16	45.7	+10
1.28	50.2	+11
1.39	54.8	+12
1.51	59.4	+13

The table indicates the vertical micro-enlargement factors to be used when compensating for differences between input and output base thicknesses. These factors have been calculated for large analyse cylinders and scans which are to be sent to E units. For large cylinders and scans which are to be sent to M units it may be necessary to increase the factors shown in the table by one.

Format and Expose Functions 9

This chapter describes the expose functions controlled from the analyse unit.

9.1 Format

The scanners can produce separations in five basic formats. These are:

- one-at-a-time (1-up), coded 1@
- two-at-a-time (2-up), coded 2V
- three-at-a-time (3-up), coded 3@
- four-at-a-time (4-up), around the cylinder, coded 4@
- four-at-a-time, (4-up), coded 2H, generally known as Automatic Rescan.

Figure 9.1 indicates the location of separations for each format option. Unlike earlier software versions the colours will always appear in the sequences shown. It is possible to change the colour/screen-angle combinations but it will be the angles which will change positions, not the colours.

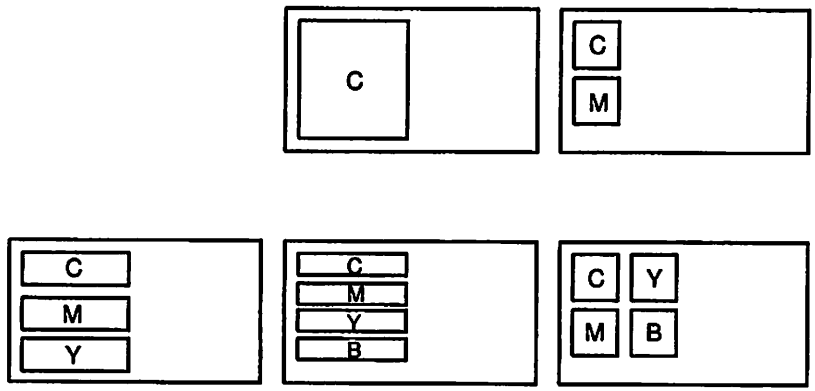


Figure 9.1 Separation formats

The table in Chapter 18 lists the angle codes available and the corresponding angles which will be used. The procedure used to change the angle codes is described in Chapter 6.

Each angle in the table is allocated to a reference number. Under default conditions the reference number is linked to the separation colours as follows; C1, M2, Y3, and B4. The use of the standard angle codes and these combinations will minimize the risk of moire but the combinations can be changed if required. The procedure used to change the colour/reference-number links will depend on the format chosen. These procedures are described for each format in the following sections.

9.1.1 1-up (1@) Procedure

Press: FORM 2V FRMT 2V C1M2Y3B4

Enter: 1

The display reverts to the monitor mode, showing **1@** on the top line.

To change the separation/screen-angle combinations:

Press: FORM

```
1@
FRMT 1@ C1M2Y3B4
```

Press: POSN

```
1@
REPOS'N? Y/N
```

Press: ↕ YES

```
1@
LAYOUT = C?M?Y?B?
```

If the required separation/screen-angle combinations are **C4**, **M3**, **Y2**, **B1**:

Enter: **432**

```
1@ 1.00 50 150
LAYOUT = C4M3Y2B1
```

This means that you will use the Black screen angle (4) for the Cyan separation. You will use the Yellow screen angle (3) for the Magenta separation, and so on.

The display reverts to the monitor mode. An * appears next to the format display, indicating that the separation/screen-angle combination has been edited:

```
1@* 1.00 50 150
AUT C ORG SCAN
```

The required colour to be exposed must be selected for each exposure, using the colour channel select buttons. e.g. 1st exposure, select **[C]**, hence the Cyan separation will be exposed with the Black screen angle, and so on. Other separation/screen angle combinations and orders of exposure are possible.

9.1.2 2-up (2V) Procedure

Press: FORM

Enter: 2

```
1@
FRMT 2@ C1M2Y3B4
```

The last-used format appears on the top line, e.g.**1@**.

Press: ↕ YES or ENTER

```
1@
FRMT 2V C1M2Y3B4
```

The display quickly reverts to the monitor mode, showing **2V** on the top line:

```
2V 1.00 50 150
AUT C ORG SCAN
```

If required, change the separation/screen-angle combinations as for 1-up.

If you want to scan the cyan and magenta separations first, press **[C]** or **[M]**. If you want to scan the yellow or black separations first press **[Y]** or **[B]**.

9.1.3 3-up (3@) Procedure

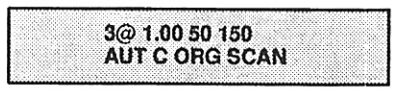
This is only available when doing a 'Trade scan', not when using a Macintosh terminal. (A trade scan is a scan which is initiated from the scanner by pressing the **[EXPOSE]** key.)

The 3@ procedure is as follows:

Press: FORM

Enter: **3**

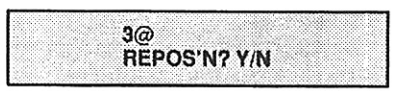
The display reverts to the monitor mode, showing **3@** on the top line:



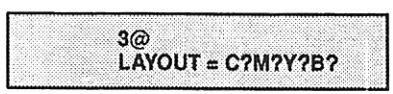
Angle swop can be made in the usual way, e.g. to **C3 M1 Y2**:

Press: FORM

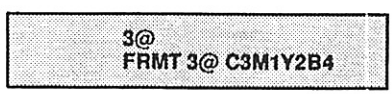
Press: POSN



Press: ↕ YES



Enter: **312**



9.1.4 4-up (4@ and 2H) Procedures

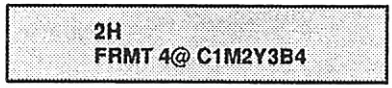
There are two 4-up options:

- 4@, around the cylinder - 'vertically'
- 2H, using auto rescan - 'horizontally'.

Around the Cylinder

Press: FORM

Enter: **4**



The last used format appears on the top line, e.g. **2H.**

The display quickly reverts to the monitor mode, showing **4@** on the top line. If required, change the separation/screen-angle combinations as for 1-up. However, there is no need to press any colour select button before exposure, since all colours are exposed in the same scan.

To interrogate the scanner regarding format, press **[FORM]**. If the format is 4@, the display will show:

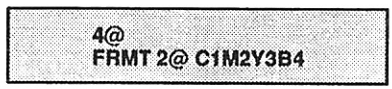
Press **[FORM]** again, to leave the format unchanged and to return to monitor mode.

Auto Rescan

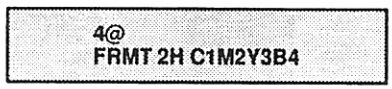
When doing a 'Trade scan', direct to film:

Press:

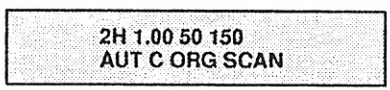
Enter: **2**



Press:



The last-used format initially appears on the top line, e.g. **4@.** The display quickly reverts to the monitor mode, showing **2H** on the top line.



The vertical gap between each pair of separations can be changed from the default of 10 mm, using CAL 34. See Section 9.3.

When doing an auto rescan from the Macintosh terminal, Format 2H scans are shown as pass 1 and pass 2 in the Macintosh Application. The analyse scanner display will indicate 2V.

9.2 Autoformat

Once an enlargement and final film size are known, the Autoformat facility can be used to set the most suitable format for a current job automatically. All format sizes available to a particular scanner type are automatically selectable except format 3 (3@).

The Autoformat facility can be used with Step and Repeat.

An automatically selected format will be indicated on the alphanumeric display after the second co-ordinate of the original film (or transparency) size has been entered.

Automatically selected formats can be overwritten manually without the need to exit, or can be cancelled with a return being made to standard monitor mode.

CAUTION

Avoid selecting 'Final Size' if Autoformat has been selected but has been manually edited. Upon leaving the Final Size routine, even if no change was made, the format will be recalculated and any manual edit will be lost.

To select the Autoformat function:

Press: CAL

Enter: 888

Press: ENTER

AUTOFORMAT ON
CHANGE Y/N

Press:

to change selection.

Press:

to keep the current selection and leave the display.

9.3 Customer Configuration

The Customer Configuration function, CAL 466, allows you to:

- select analyse unit responses which are appropriate for scan-to-film or scan-to-disk
- for scan-to-film operation, select what will happen when the upper half of the film is being exposed and the next image is too large for the film width remaining, This can only be used in conjunction with film-save. See Section 9.4
- for scan-to-film operation, enter the intended expose unit so that the analyse unit can make the appropriate calculation.

To view or change the settings:

Press: CAL

Enter: **466**

Press: ENTER

The display indicates the action which will be taken if there is not sufficient room on the upper half of the film for the next image.

To change the selection:

Press: △

UPR 1/2 TOO WIDE
UPPER TO LOWER

The scanning will continue and the next image will be exposed on the lower half of the film.

Press: ▽

UPR 1/2 TOO WIDE
O/P TOO WIDE

The scanning will be stopped so that you can decide whether to select a smaller image which will fit the space available and so save film.

When the appropriate mode has been selected:

Press: ENTER

The display indicates whether the size check for scan-to-film will be performed.

To change the selection:

Press: △ SIZE CHECKS DISABLED

No check on the film width remaining will be performed. This option is intended for use when scanning to disk.

Press: ▽ SIZE CHECKS ENABLED

The film width remaining will be calculated, based on the expose unit size. The calculation will depend on the selection made in the next step.

Press: ENTER

The current expose unit destination is displayed.

To change the selection:

Press: △ EXPOSE TYPE MAXIM

The analyse unit is expecting the image to be output to an M Output Scan Station and will calculate the film width remaining accordingly.

Press: ▽ EXPOSE TYPE E UNIT

The analyse unit is expecting the image to be output to an E or EA Output Scan Station and will calculate the film width remaining accordingly.

To leave the display:

Press: ENTER

9.4 Film-Save (Trade Scans Only)

Electronic dot generation allows separations to be closely spaced on the output film. Separations are now butted-up vertically, thus small enlargements can be exposed on one half of the film, leaving the remaining half available for further exposures. This facility is particularly useful for small exposures on a Maxim exposure unit and considerable savings can be made. To maximize the effectiveness of the Film-Save capability, the final size of the separations must be considered when deciding the order of exposure.

Note: 2H format cannot be set when exposing onto the lower half of the film.

Note: Film-Save can only be used for trade scans on a combined scanner (i.e. when the expose unit is not stand-alone). Film-Save is not available on the Macintosh terminal.

9.4.1 Procedure

To enter the Film-Save mode and to select the upper half of the output film,

Press: FORM

Use: Δ

```
EXPOSE ON UPPER
1/2 OF FILM ONLY
```

The display then reverts to the monitor mode,

```
4@U 1.00 50 150
MAN C SEP SCAN
```

The **U** on the top line indicates, that the upper half of the film will be exposed.

To change the format whilst retaining the upper half restriction.

Press: [FORM]

Enter: **2** (if 2 up required).

Press: [↕ YES]

Expose the first set of separations.

Exposure continues across the width of the film until the Alphanumeric Display gives the message,

O/P TOO WIDE

This message means that there is insufficient film available to accept the next set of separations.

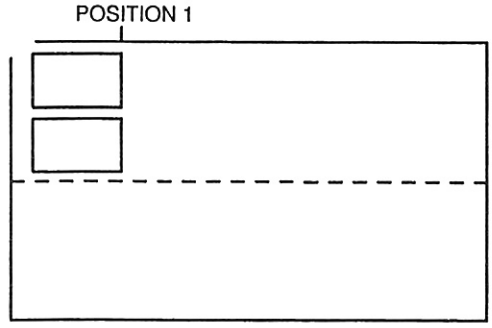
To continue exposure the lower half of the film has to be selected,

Press: [FORM]

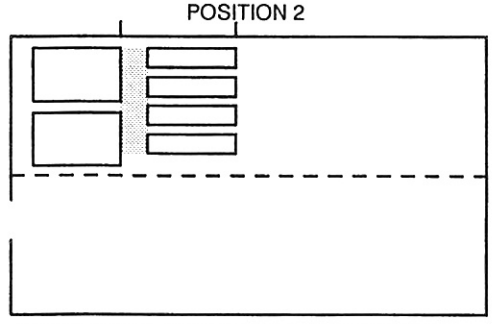
Press: [▽]

EXPOSURE ON LOWER 1/2 OF FILM ONLY

Reverting to the monitor mode with **L** displayed as part of the format indicator.



THE SCANNER AUTOMATICALLY NOTES THE FINISH POSITION OF THE FIRST SET OF EXPOSURES.



THE SECOND SET OF SEPARATIONS CAN THEN BE EXPOSED WITH THE SCANNER AGAIN NOTING THE FINISH POSITION.

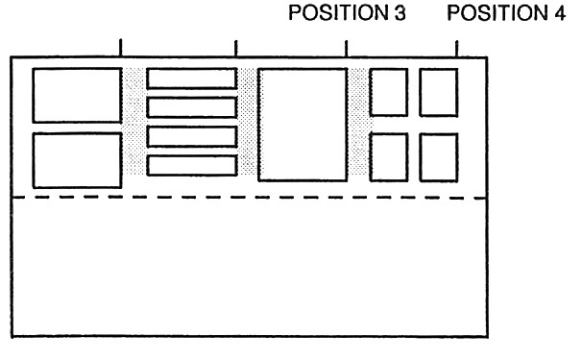


Figure 9.2 Filmsave expose-sequence

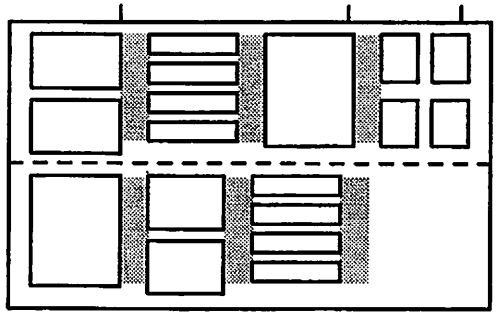


Figure 9.2 Continued

The first set of separations on the lower half of the output film is now exposed. Exposure can be continued on the lower half in the same manner as for the top half.

Continue to expose across the lower half of the output film or until the Alphanumeric Display gives the message,

O/P TOO WIDE

This message means that there is insufficient film available to expose next scan.

To cancel the Film-Save mode,

Press: FORM

Press: —

9

9.5 Expose Hold and CAL 34

The Expose Hold function stops the expose carriage from resetting to the start position for the next exposure. This allows economical use of output film. The expose head moves across the cylinder for a short distance to prevent one exposure starting where another one has finished.

The distance that the carriage moves can be set by the operator, directly in millimetres up to 255 mm using CAL 34. If no value is chosen by the operator, the scanner will use a value of 10 mm for the carriage movement.

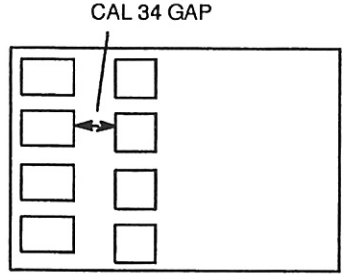


Figure 9.3 Separation gap

Note: The horizontal separation gaps can be changed using CAL 880. See Section 15.2.

The Expose Hold function can be set on or off by pressing **[EXPOSE HOLD]**. Note, however, that this function may also be set automatically on AutoLoader Expose units:

- If Auto Film Eject is selected the film will be ejected at the end of the expose sequence and the carriage will be reset, regardless of the Expose Hold selection previously made. If the Expose Hold light was lit it will be turned off.
- If Auto Film Eject is not selected the carriage will not be reset at the end of the expose sequence, regardless of the Expose Hold selection previously made. If the Expose Hold light was

not lit it will be turned on. Expose Hold may then de-selected by pressing **[EXPOSE HOLD]**, if required.

- If a Job file is recalled to the scanner the Expose Hold function will be reset according to the scanner set-up when the Jobfile was created. Unless the function is checked (and reset if required) there is a risk that either the next image will be exposed over the previous image, or that the next image will start to the right of the normal start position.

When using Autoscan software it is not possible to use Expose Hold. The Autoscan sequence will always start at the top left of the expose area.

9.5.1 2H Formats

When a 2H format has been selected, the gap between the left-hand and right-hand separations is set by default to 10 mm and is only defined by an operator if it has to be changed to a different value. **[CAL] 34** can be used to change the gap to any value up to 255 mm providing the separations remain within the film size.

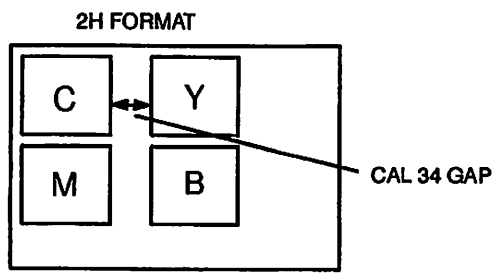


Figure 9.4 Gap between auto rescans

9.6 Step and Repeat

When in trade scan configuration, multiple exposures of an image can be made in each available format size using the Step-and-Repeat function. This function can be used with either manual formatting or Autoformat.

To begin Step-and-Repeat:

Press: FORM

Press: X → ENTER HORIZONTAL REPEAT NO

Enter a value up to 32 for the horizontal repeat, as required:

Press: ENTER → ENTER VERTICAL REPEAT NO

Enter a value for the vertical repeat, as required. Permissible ranges are:

32 for 1@
16 for 2V
10 for 3@
8 for 4@.

Press: ENTER → ENTER HORIZONTAL SEP GAP 3.0

Enter a value up to 25.0 mm (in 10ths of mm; minimum value is 0.1 mm), then:

Press: ENTER → ENTER VERTICAL SEP GAP 3.0

Enter a value up to 25.0 mm (in 0.1 mm; minimum value is 0.1 mm).

Press: ENTER

9.6.1 Return to Normal Scanning

To return to normal scanning after completing a Step-and-Repeat sequence:

Press: FORM then X then ↔ NO

Horizontal and vertical repeat numbers revert to a default value of 1. Horizontal and vertical gaps will remain as set during the last Step-and-Repeat operation.

To return the scanner to normal operation at any time during setting-up of Step-and-Repeat:

Press: ↔ NO

9.7 Displaying the Expose Head Position

CAL 43 will give the expose head position and the useable film-width remaining on the **analyse** Alphanumeric Display:

Press: [CAL]

Enter: **43**

Press: [ENTER]

EXP : 1 AT 90 MM

In this example the expose head is positioned at 90 mm from datum.

To return to the monitor mode:

Press: [ENTER]

9.8 Selecting Negative or Positive Output

The **[NEG]** button is used to switch between negative and positive output. When the button is lit negative separations are produced.

To switch between the two modes:

Press:

9.8.1 Selecting a Negative Black Separation

It is possible to output a negative black separation while outputting the other three colours as positives.

To view the current mode:

Press:

Enter: **38**

Press:

To terminate the display without making a change:

Press:

Alternatively, to change between positive and negative modes:

Press:

The mode changes. After about 2 seconds the display changes back to the monitor mode.

9.9 Selecting Lateral Reversal

The Lateral Reversal button, **[LAT REV]**, is used to select the direction in which the analyse carriage moves when scanning.

Illuminated	=	right to left
Not Illuminated	=	left to right.

When the button is not illuminated, a transparency that is mounted wrong reading, emulsion-up, will be scanned to give a separation which, when viewed emulsion-up, will be wrong reading (laterally reversed). This is the normal mode of operation for offset litho.

To switch between the two modes:

Press:

Lateral reversal now permits the mixing, in any order, of normal and laterally reversed jobs, to the same sheet of film. The output scans proceed from left to right across the film.

9.10 Starting the Expose Cycle

An exposure is initiated directly from the analyse unit or from the Macintosh.

Check that the expose unit is ready for operation, ensure that the analyse unit lids are closed, then:

Press: Analyse **EXPOSE**

The following messages may be seen at the analyse unit display, during a typical scan cycle:

Message	Meaning
MATRIX DONE (counts up to 100)	The scanner is calculating the colour tube
SCAN START SEARCH	Locating the start position of scan
USM'SYMC	Setting Unsharp Masking values
DRUM SPEED CHECK	Checking the speed of the cylinder and the drum
SCAN COUNT DOWN (Indicates % remaining)	Scan in progress report
SCANNER WAITING FOR JOB DOWNLOAD	The Macintosh terminal is busy and the scanner is waiting for the next job in a multran/queue sequence

9.11 CAL 35 (Trade Scanning Only)

CAL 35 can be used to define the centre of the film. This function is not normally required as the film centre is defined by default for use on standard size film. However, if non-standard film sizes are used, then select **[CAL] 35** to define the film centre.

Scanner BVs, CVs, JVs and Edits

10

This chapter describes the use of the scanner Basic Values (BVs), Customer Values (CVs) and Job Values (JVs).

This chapter does not describe the Job Files and enhanced CV facilities which are accessed from the Macintosh terminal. These are described in the Celsis 6000 Macintosh User Interface Manual, see Associated Documents.

Scanner reset CAL numbers, 900 and 902 are described.

The general approach to editing the scanner Job Values is outlined and the function of the **CANCEL EDIT** *and* **SUPP EDIT** *buttons is described.*

An operation sequence is recommended which will reduce the time taken to perform a scan.

10.1 Introduction

The diagram below shows the data storage areas within the scanner and Macintosh terminal and the flow paths between them.

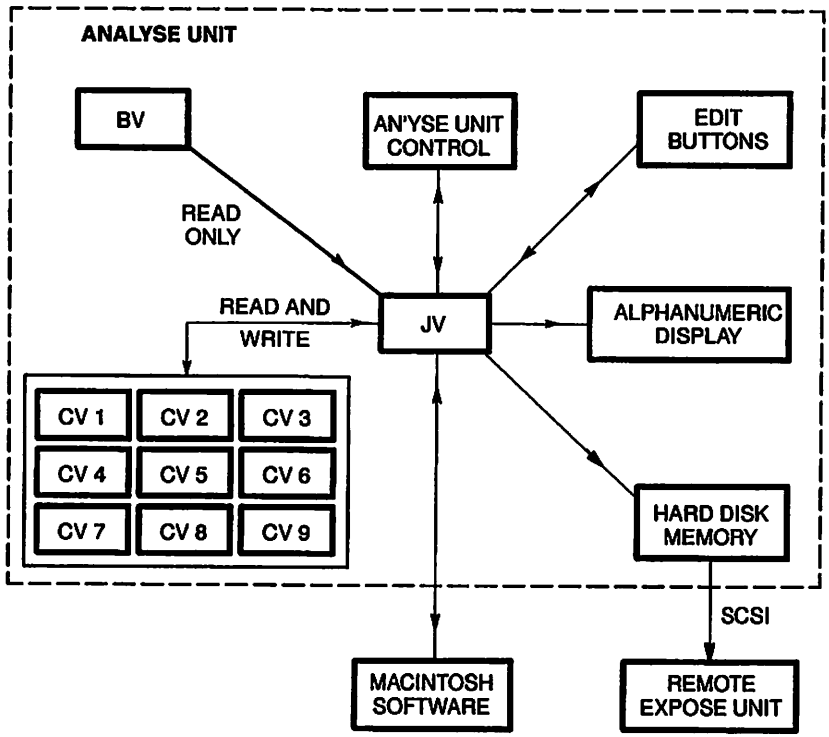


Figure 10.1 Data storage and flow paths

10.1.1 BVs

The BVs are stored in the analyse unit when it is installed. You cannot change these values and they will not be lost if the analyse unit is switched off. If this data is transferred to the JV memory, these basic values can be used to produce an acceptable set of

separations from good quality transparencies. The BVs are recalled to the JV memory when resetting the scanner using CAL 902.

The data is organized into blocks, each corresponding to an edit function. You can transfer all of the BV data or selected blocks to the JV memory. The memory address for the BV memory is coded CV0.

10.1.2 CVs

Nine sets of CVs are available. You can transfer all or selected blocks of CV data to the JV memory. CVs are suitable for the storage of job set-ups. Memory addresses for the CV are CV1 to CV9.

10.1.3 JVs

The JV data is used to control the scan. The data may have come from the BV or the CV memories or the Macintosh terminal setup files. The data can be viewed on the alphanumeric display and can be edited from the edit buttons on the scanner keyboard. You can transfer all or selected blocks of JV data to the CV memories and the Macintosh.

10.1.4 Macintosh Terminal

The Macintosh terminal provides a further source of scanner data. For more information, refer to the Celsis 6000 Macintosh User Interface Manual, see Associated Documents.

10.1.5 Data Blocks

The following data is available from each of the areas of memory. In each case the abbreviations which appear on the alphanumeric display are given in brackets.

Grey Balance	(GBAL)	Cast 2	(CST2)
Colour Correction	(CC)	Limits	(LMTS)
Output Calibration	(OCAL)	Black Printer	(BLAK)
PCR + UCR	(UPCR)	Breakpoints	(BRKP)
Catchlight	(CLT)	EDG	(EDG)
Luminosity	(LUM)	USM Data	(USM)
Neutral Tone	(NTON)	Pastel Boost	(PSCR)
Permanent Tone Boosts	(PTBS)	Enhanced Colour	(ENHC)
Cast 1	(CST1)	Channel Boost	(CHNB)
Autobalance Targets	(ABAL)	Resolution	(RESN)

10.2 Storing Data

10.2.1 Storing Data in CVs

JV data can be stored as a CV using the 2XX series of CAL numbers. You can store all blocks or selected blocks. The table below lists the store options, the alphanumeric display code and the CAL number used:

Function	Alphanumeric Display Code	Store CAL Number
Grey Balance	GBAL	213
Colour Correction	C.C.	212
Output Calibration	OCAL	201
PCR + UCR	UPCR	214
Catchlight	CLT	217
Luminosity	LUM	253
Permanent Tone Boosts	PTBS	210
Cast 1	CST1	216
Cast 2	CST2	215
Limits	LMTS	218
Black Printer	BLAK	211
Breakpoint	BRKP	220
EDG	EDG	219
USM	USM	258
Pastel Boost	PSCR	263
Enhanced Colour	ENHC	264
Channel Boost	CHNB	265
Resolution	RESN	221
Autobalance Targets	ABAL	252
All Blocks	FULL	230

Neutral Tone Boosts can only be stored as a part of a full block. using CAL 230.

To store a function, Colour Correction for example:

Press:

Enter: **212**

Press: ENTER

Select the block required (0 for BV, 1 to 9 for CVs) i.e. 1:

Enter: **1**

Press: ENTER

Press: ▲▼ YES

This will store the JV data in the appropriate CV block and the display will return to the monitor mode.

10.3 Recalling Data

10.3.1 CAL 1XX Method

CV or BV data can be recalled to the JVs using the 1XX series of CAL numbers. You can recall all blocks or selected blocks. The table below lists the recall options, the alphanumeric display code and the CAL number used:

Function	Alphanumeric Display Code	Recall CAL Number
Grey Balance	GBAL	113
Colour Correction	C.C.	112
Output Calibration	OCAL	101
PCR + UCR	UPCR	114
Catchlight	CLT	117
Luminosity	LUM	153
Permanent Tone Boosts	PTBS	110
Cast 1	CST1	116
Cast 2	CST2	115
Limits	LMTS	118
Black Printer	BLAK	111
Breakpoint	BRKP	120
EDG	EDG	119
USM	USM	158
Pastel Boost	PSCR	163
Enhanced Colour	ENHC	164
Channel Boost	CHNB	165
Resolution	RESN	121
Full Block	FULL	130
BV to Keyboard		199
Auto Balance Targets	ABAL	152

Neutral Tone Boosts can only be recalled as a part of a full block. using CAL 130.

To recall a function, CAST 1 for example:

Press: CAL

Enter: **116**

Press: ENTER

RECALL CST1
NUMBER?

Enter the number of the block you require, i.e. 4:

Enter: **4**

RECALL CST1
NUMBER? 4

To recall the data to the JV:

Press: ENTER

The display will return to the monitor mode.

10.3.2 CAL 31 Method

When this CAL number is entered, the alphanumeric display will step through the scanner set-up functions, prompted by **[ENTER]**. The following functions are displayed:

Function	Code
Grey Balance	GBAL
Colour Correction	C.C.
Output Calibration	OCAL
PCR + UCR	UPCR
Catchlight	CLT
Luminosity	LUM
Neutral Tone Boost	NTON
Permanent Tone Boost	PTBS
Cast 1	CST1

Function	Code
Cast 2	CST2
Limits	LMTS
Black Printer	BLAK
Breakpoint	BRKP
EDG	EDG
USM	USM
Pastel Boost	PSCR
Enhanced Colour	ENHC
Channel Boost	CHNB
Resolution	RESN
Autobalance Targets	ABAL

The BV or CV block in use (i.e. in JV) is indicated for each function in turn. A different BV/CV block can be entered in each case, if required. For example:

Press: CAL

Enter: **31**

Press: ENTER

CURRENT GBAL CV
IS BLOCK 0

(BV is in use).

To confirm and step to the next function:

Press: ENTER

CURRENT C.C. CV
IS BLOCK 2

(CV2 is in use).

To change the block in use, Select: **0** to **9**.

Press: ENTER

The selected CV is transferred into JV, overwriting the previous CV in use. The next function appears. If you do not wish to step through all 16 functions, press **[STOP]**. The scanner will bleep once and return to the monitor mode.

10.4 JV Information

10.4.1 Viewing the Origin of Current Blocks

When CAL 30 is entered, the alphanumeric display will list the origin of the current JV blocks.

Press: CAL

Enter: **30**

Press: ENTER

```
02015500
00030010
```

The first sixteen blocks are displayed. The table below indicates the blocks used in this example (0 = BV):

	Function	Code	Origin of Block
Top Row	Grey Balance	GBAL	BV
	Colour Correction	C.C.	CV2
	Output Calibration	OCAL	BV
	PCR + UCR	UPCR	CV1
	Catchlight	CLT	CV5
	Luminosity	LUM	CV5
	Neutral Tone Boost	NTON	BV
	Permanent Tone Boosts	PTBS	BV
Bottom Row	Cast 1	CST1	BV
	Cast 2	CST2	BV
	Limits	LMTS	BV
	Black Printer	BLAK	CV3
	Breakpoint	BRKP	BV
	EDG	EDG	BV
	USM	USM	CV1
	Pastel Boost	PSCR	BV

Press: ENTER

```
020
```

The remaining four blocks are displayed:

	Function	Code	Origin of Block
Top Row	Enhanced Colour	ENHC	BV
	Channel Boost	CHNB	CV2
	Resolution	RESN	BV
	Autobalance Targets	ABAL	BV

To return to the monitor mode:

Press: ENTER

10.4.2 Displaying Edited Blocks

When CAL 32 number is entered, the alphanumeric display will indicate those functions which have been edited using the scanner keyboard.

NONSTANDARD DATA
GBAL

The display steps automatically through the functions showing each for about a second. Finally, the scanner bleeps once and returns to the monitor mode. The functions which might appear in this sequence are those displayed with CAL 30.

If none of the functions have been edited in the JV block, the scanner will bleep once and immediately return to the monitor mode with the message:

ALL DATA
STANDARD

10.5 Clearing Job Values

CAL 900 is used to reset the scanner without turning off the power. It is of use if the scanner memory has become corrupted.

Enter **[CAL] 900** to initiate the reset sequence. The previous JVs will be cleared.

The scanner will automatically perform a datum search at the end of the reset procedure.

When the Current Value Display shows '-' in all positions, the scanner has not yet been autobalanced.

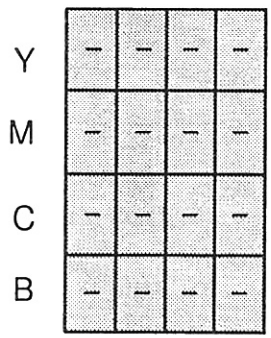


Figure 10.2 Current value display

To align the scan spot before performing an Autobalance, enter **[CAL] 40** and proceed with the alignment.

To perform an Autobalance, enter the Autobalance sequence by pressing **[AUTOBAL] [YES]**. The display will revert to normal.

It will also be necessary to rotate the cylinder to set the horizontal datum.

New JVs can now be loaded from the BV or CV blocks and edited as required.

10.6 Clearing Customer Values and Job Values

CAL 902 has a similar function to CAL 900 but in addition it clears the data from CV blocks. Enter **[CAL] 902** to initiate the reset sequence. The analyse display changes to:

To clear JVs, press **[YES]**. To abort the sequence press **[NO]**. If **[YES]** is pressed the display changes to:

Press **[YES]** to proceed or **[NO]** to abort.

To clear CVs, press **[YES]**. To abort the sequence press **[NO]**. If **[YES]** is pressed the display changes to:

Press **[YES]** to proceed or **[NO]** to abort.

After the scanner has automatically performed a datum search, perform an Autobalance.

To perform an Autobalance, enter the Autobalance sequence by pressing **[AUTOBAL] [YES]**. The Autobalance sequence will start.

When the sequence has been completed the BVs can be loaded into the CV blocks and each CV block can be edited as required.

CAL 902 clears the laser power setting. It will be necessary to re-enter it.

It will also be necessary to rotate the cylinder to set the horizontal datum.

10.7 Performing Edits

A wide range of colour and tone edits are possible from the scanner keyboard. The procedures are described in the following chapters. Two functions which are of general use when performing edits are initiated from the **[CANCEL EDIT]** and **[SUPP EDIT]** keys.

10.7.1 Cancel Edit

The **[CANCEL EDIT]** button lights up when edit functions have been selected or entered into the scanner provided that the last used CV and the JV are not the same. EW and EB procedures **do not** cause the button to light up.

To cancel all the Edit functions (Colour, Tone, Cast 1, Cast 2, PCR, Catchlight, Limits, Black, Pastel Boost):

Press:

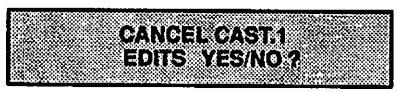
To cancel all edits:

Press:

The scanner bleeps once, cancels all edits, switches off the **Cancel Edit** light. The display returns to the monitor mode.

If you do not want to cancel all edits:

Press:



Press:

or

The scanner displays the first edit function on which an edit has been performed (Cast 1 in this example) and asks you if you wish

to cancel the edit. It repeats this for each edited function in turn, stepping through them as **[YES]** or **[NO]** are pressed. The Cancel Edit light will only go out if all edits are cancelled.

Suppress Edit

The **[SUPP EDIT]** button is used to see what effect an edit function is having.

- With an edit function selected, press and hold down the **[SUPP EDIT]** button. Any edits which have been made using the selected edit function will be suppressed and the values before the edits were applied will be displayed. Release the button to restore the edit.
- If you press **[SUPP EDIT]** with no edit function selected the values will be displayed with grey balance suppressed. Other edits will not be suppressed.

10.7.2 Reducing Loading Time

The Dual Speed System Controller starts loading the 3D Look-up Table (LUT) immediately after the scanner has been initialized and also after any colour edits have been made. The loading of the 3D LUT is invisible to the operator, who can still be setting up the scanner whilst it is being done.

Features, used in colour editing, which **do affect** the loading of the 3D LUT are:

PCR and UCR	Cast 1 and 2
Pastel corrections	Auto shadow neutralization
Colour corrections	Neutral selective tone boost
Grey balance	Black printer
Maximum print density	

The scanner spends the majority of the time, from when **[EXPOSE]** is pressed to when it actually starts scanning, in loading the 3D LUT. The operator, through the Dual Speed System Controller, can reduce job set-up time by entering any of the colour edits, listed in the previous paragraph, towards the beginning of the job set-up sequence followed by any of the features that do not affect the loading of the 3D LUT. Features **not affecting** the loading of the 3D LUT are:

Catchlight	Enlargements
Dot shape	Formats
Screen angles	Negative
Limits	Autobalance
Scan rate	USM (CAL 508)
Luminosity curves	HL, MT, SH tone boost

For a new scan where no colour editing is required, the 3D LUTs are not re-loaded.

Suggested Job Set-up Sequence for Straight Scans

A suggested sequence for optimizing the reduction of job set-up time is:

1. Power-up
2. Focus
3. Autobalance (it should be noted that Autobalance can be achieved without entering View mode)
4. Define scanned area
5. Set Magnification
6. EW and EB
7. Colour edits

8. Features **not affecting** loading of the 3D LUT with the exception of Autobalance
9. Scan.

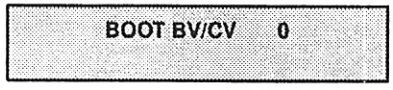
10.8 Selecting JVs at Power Up

When the system is powered up data is entered in to the JVs from either the BVs or one of the CVs. The selection of the BV/CV used is made before powering down using CAL 965.

Press: CAL

Enter: **965**

Press: ENTER



The BV block (**0**) is displayed. To specify the BV block for recall:

Press: ENTER

To specify an alternative CV block, enter the block number you require and

Press: ENTER

10

Unsharp Masking 11

This chapter describes the procedures required to edit the Unsharp Masking (USM) settings.

11.1 Introduction

Unsharp Masking is an electronically generated effect which increases the apparent sharpness of the subject. It works by accentuating contrast at an edge or around a point.

Figure 11.1 shows the dot % value recorded as the scanner passes over the boundary between a light and dark tone. In the right-hand example USM has been applied. Note how the edge has been enhanced by the introduction of light and dark fringes. Providing excessive USM is not applied the eye will not see the fringes but will see a sharper image.

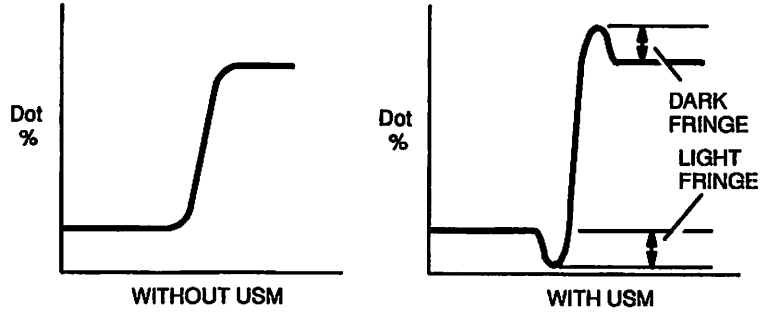


Figure 11.1 Dot % variations across an edge

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11.2 USM Sharp and Smooth

11.2.1 USM Sharp

This is the principal USM setting. It determines the level of fringing to be applied. Its effect is, however, modified by other USM settings.

USM Sharp can be set within the range of 0 to 9 (9 gives maximum USM).

11.2.2 USM Smooth

If low level contrast is enhanced, photographic grain, skin blemishes etc., become exaggerated. It is generally necessary to suppress USM at these contrast levels. Smooth gain is used for this purpose by reducing the Sharp gain at contrast levels below a Threshold setting (set with CAL 508, see Section 11.5).

You can enter values in the range 0 to 9 units, in steps of 1 unit (9 gives maximum suppression).

11.2.3 Sharp/Smooth Operation

To enter USM Sharp and Smooth values, 5 and 2 for example:

Press:	USM	Y=Y M=C C=C B USM SHARP =0
Enter:	5	
Press:	ENTER	Y = Y M = C C=C B USM SMOOTH =0
Enter:	2	

Press: ENTER

4@ 1.00 52 150
MAN C SEP SCAN

Note: The BV default values for fringe channels will be Y=Y, M=M and C=C.

11.3 Black Gain

The Black Gain facility affects the black separation only. An increased factor results in an increase in fringe size and therefore produces a sharper black.

The BV for black gain is set to a default value. If required, values from 1 to 16 may be entered instead. Recommended values are listed in Chapter 18.

Press: USM

Press: B

ENTER BLACK USM
GAIN 1-16 :

Enter: n

Press: ENTER

11.4 Cross-coupling of USM Data

Cross-coupling of data allows the operator to take USM information from one channel and apply it to another.

This information can be advantageous for subjects such as flesh tones, where very soft texture is required but at the same time sharp hair is needed. The Magenta and Yellow may be cross-coupled to the Cyan signal the flesh tone will be made smooth because the Cyan will be the lowest signal in the Flesh colour, so blemishes or marks on the skin will not be enhanced. However, once the hair is sampled, the density changes will become more dramatic so the hair will appear sharp. To achieve this result:

Press: USM

```
Y=? M=? C=? B
USM SHARP = ?
```

Press: COLOUR

Press: C and C and C

```
Y=C M=C C=C B
USM SHARP = ?
```

1. To enter a new value for Sharp:

   Enter: **n** (range 0 to 9)

   Press: ENTER

   Then similarly, enter a value for Smooth.

2. To re-input existing Sharp and Smooth values:

   Press: ENTER twice.

For subjects such as landscapes, the Cyan and Yellow may be cross-coupled to the Magenta signal. This will probably produce a very sharp result. The Magenta channel will have the most contrast and as USM is based on density changes then this will give maximum USM in all channels.

It should be noted that when cross-coupling is used the Colour Gain data of the channel to which other colours are coupled will be used. This means in our flesh tone example, for instance, if the Yellow channel originally had high Colour Gain (4 to 6), once it is cross-coupled to the Cyan this will no longer apply. The Colour Gain will then be that for the Cyan channel, so instead of a value from 4 to 6, a Colour Gain of 1 will apply.

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11.5 CAL 508 Functions

The CAL 508 functions are listed in the sequence in which they appear:

- Threshold (range: 0 to 32)
- Fringe Clip (range: 0 to 127)
- Density 1 (range: 0 to 255)
- Density 2 (range: 0 to 255)
- Colour Gain, Yellow (range: 1 to 8)
- Colour Gain, Magenta (range: 1 to 8)
- Colour Gain, Cyan (range: 1 to 8)
- Negative Gain (range: 1 to 8)
- White Attenuation (range: 1 to 8).

To display the functions:

Press: CAL

Enter: **508**

Press: ENTER

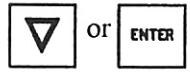
The first CAL 508 function appears. Recommended values are given in Chapter 18. To change the value:

Enter: **nn**

Press: ENTER

The display moves on to the next CAL 508 function.

To step forward through the sequence, without making a change:

Press:  or

To step backward through the sequence:

Press:

A keypad entry which is too high gives two bleeps and the display changes to:

To exit from the sequence it is necessary to step through each function.

11.5.1 Threshold

Threshold separates those density variations where USM Sharp has full effect, from those where USM Sharp is reduced, neutralized or reversed by USM Smooth.

You can enter values in the range 0 to 32 units, in steps of 1 unit. At 32 USM Sharp operates at maximum contrast levels. It is unlikely that you will need to enter values outside of the range 2 to 10. The BV (default value) is 2. At low Threshold values USM Smooth affects little picture detail. At higher Threshold values USM Smooth affects more picture detail and unsharp picture detail is likely. A very high Threshold value (above 10), together with a high smoothness value, will give a very unsharp separation.

If a set has 'black spots' then Threshold and/or Fringe Clip can be used to reduce these. Threshold can also be used for originals which are noisy in what should be smooth areas, or for subjects

which are required to look smooth with few harsh edges, such as some watercolour or wash drawing originals.

Figure 11.2 demonstrates the effect of two example Thresholds for a range of USM Smooth values.

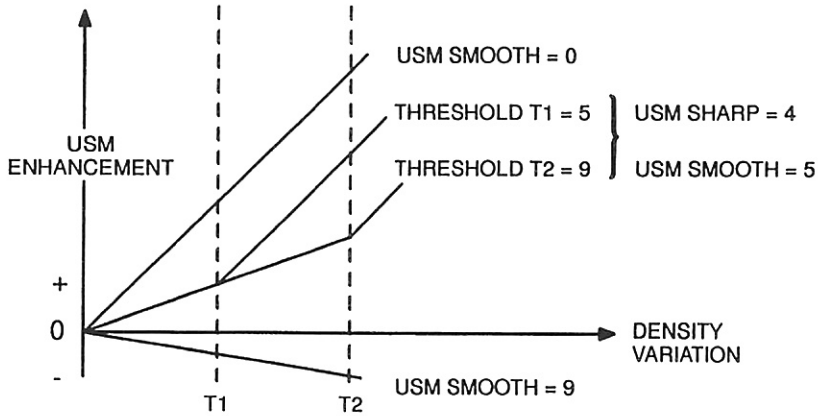


Figure 11.2 Effect of threshold

11.5.2 Fringe Clip

A high USM gain factor can give rise to heavy and unacceptable fringe characteristics. It is also possible that high frequency noise will occur, appearing as black spots in the fringe. To overcome these problems the Fringe Clip facility has been added. This facility has the effect of limiting the fringe level at high contrast areas whilst maintaining full USM gain in areas of lower contrast. Recommended values are given in Chapter 18.

Fringe Clip is entered as a DAC number which specifies height D in Figure 11.3.

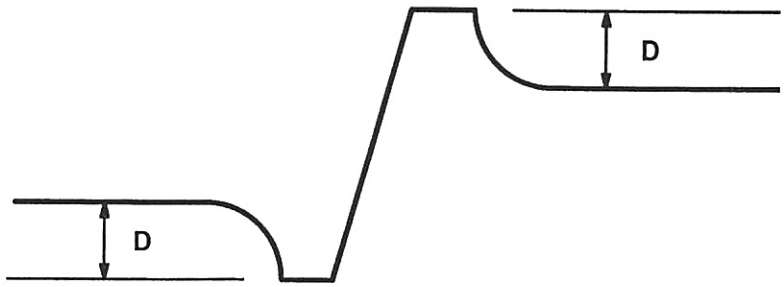


Figure 11.3 Fringe clip applied to light and dark fringes

11.5.3 Density 1 and Density 2

There is little detail in high density areas of an original but usually the dyes are grainy. It is beneficial to reduce USM Sharp in these areas.

At **Density 1** USM Sharp starts to reduce.

At **Density 2** USM Sharp becomes zero.

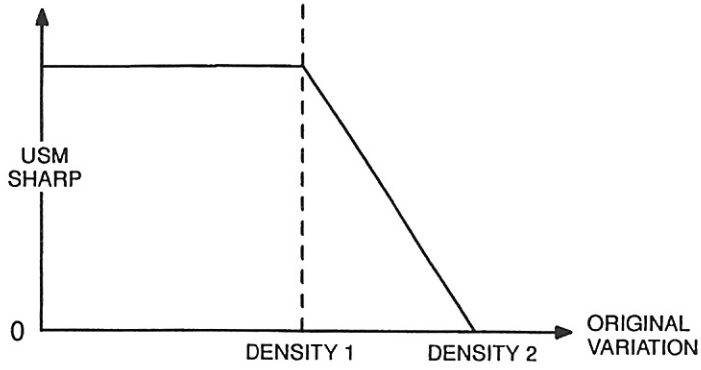


Figure 11.4 Roll-off

Assuming a linear tone shape, USM Sharp would reduce as shown in Figure 11.4.

Density 1 and Density 2 must each be entered as a whole number value in the range 0 to 255 units. BV (default values) are: Density 1 = 150, Density 2 = 255 units.

11.5.4 Colour Gain

The gain for each of the yellow, magenta and cyan channels can be reduced independently, using modifying values which are entered at Steps 5, 6 and 7 respectively of the CAL 508 sequence.

Enter values from 1 to 8. A value of 1 gives no reduction in gain, 2 gives approximately $^1/_2$ the gain, 3 gives approximately $^1/_3$ the gain etc.. For normal use a value of 4 is recommended for the yellow channel and 1 is recommended for the magenta and cyan channels. These are also the default values.

11.5.5 Negative Gain

The dark fringe can be increased independently of the light fringe, using Neg Gain.

Neg Gain is useful when negative separations are to be scanned and then contacted to positive at a later stage. When the contact copies are made, fill in of white fringe detail (on the positive) occurs. To compensate for this, the dark fringe on the negative can be increased using Neg Gain.

Considerable increase in apparent sharpness can also be achieved by using Neg Gain on positive separations.

Enter values in the range 1 to 8 units in steps of 1 unit. The BV (default value) is 1. Normal working values should be 2 or 3. The black fringe becomes more visible especially when Neg Gain is

greater than 3. The setting chosen is very subjective and only the user will know the type of separation his customers demand.

11.5.6 White Attenuation

Under certain circumstances light fringes need to be suppressed. For example when type overlays a tint panel the fringe can be highly visible. White Attenuation can be used in these cases, to reduce light fringes independently of dark fringes.

Enter values in the range 1 to 8 units in steps of 1 unit. As the value entered is increased, the white fringe is reduced. At the maximum value there is no white fringe. The default value is 5.

It should be noted that if white fringes are totally removed, the overall effect can be an increase in density. This is because the density value is obtained from an overall reading which includes the average of the White and Black fringes, so if the White fringe is removed the average increases.

Tone and Colour Edits 12

This chapter describes the procedures which can be used to edit the tone and colour rendering of the output image.

This chapter does not include the setting up of grey balance and black printer adjustments. These topics are described in Chapter 13. Under Colour Removal and Polychromatic Colour Removal procedures are both described in the Chapter 14.

12.1 Tone

Tone is a retouching feature of the scanner that is used to change the tonal values of the printed results. You can increase or decrease the contrast or detail in five tonal regions, Highlight, $^{1}/_{4}$ Tone, Midtone, $^{3}/_{4}$ Tone or Shadow.

The numbers shown on the Alphanumeric Display are index numbers. The effect of ±10 index numbers for each tonal region is shown in Figure 12.1.

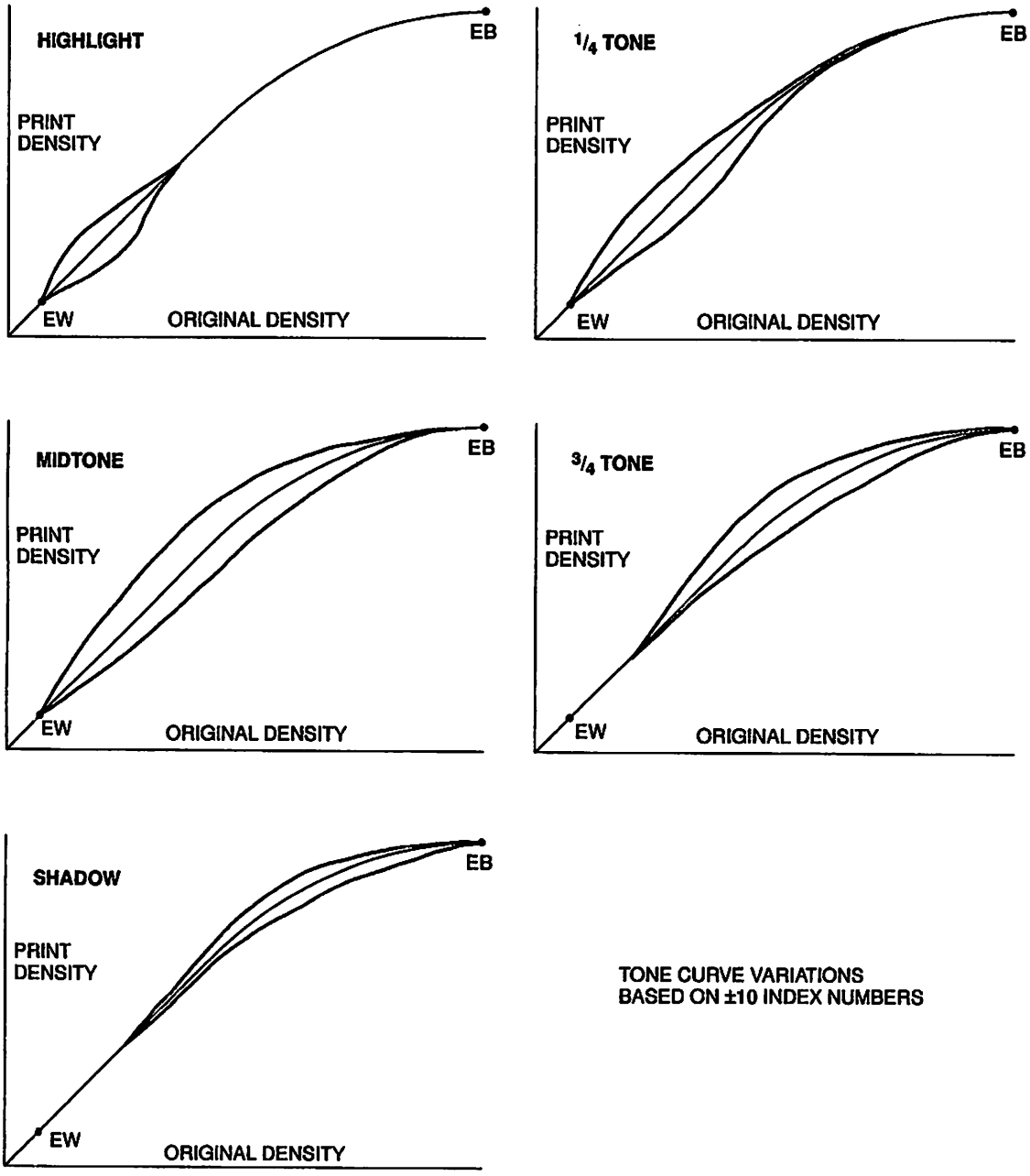


Figure 12.1 Tone boost curves

The scanner will try to scan any curve you select. If you try to use a Tone control to produce an unnatural or illogical tone curve, the scanner will alter this entry to give the maximum permissible Index number for the change you want to make. The scanner will bleep three times.

12

12.1.1 Where to Use Tone

Altering the Tone curve in one area will result in changes elsewhere in the curve. The table below shows what effects the Highlight (HL), Midtone (MT) and Shadow (SH) Tone controls have in different tonal areas, and may be extrapolated for the $^1/_4$ and $^3/_4$ tonal areas. The table should be compared with the graphs in Figure 12.1.

Tone Set	Effect on HL Dot %	Effect on HL Contrast	Effect on MT Dot %	Effect on MT Contrast	Effect on SH Dot %	Effect on SH Contrast
HL +	Higher	More Detail	Higher	Minimal Change	Slightly Higher	Slightly Less Detail
HL -	Lower	Less Detail	Lower	Minimal Change	Slightly Lower	Small Increase in Detail
$^1/_4$ +	Higher	More Detail	Higher	Minimal Change	Minimal Change	Minimal Change
$^1/_4$ -	Lower	Less Detail	Lower	Minimal Change	Minimal Change	Minimal Change
MT +	Higher	More Detail	Higher	More Detail	Higher	Less Detail
MT -	Lower	Less Detail	Lower	Less Detail	Lower	More Detail
$^3/_4$ +	No Change	No Change	Higher	More Detail	Higher	Less Detail
$^3/_4$ -	No Change	No Change	Lower	Less Detail	Lower	More Detail
SH +	No Change	No Change	Higher	More Detail	Higher	Less Detail
SH -	No Change	No Change	Lower	Less Detail	Lower	More Detail

Transparency quality and customer's specification largely determine the changes that should be made to the Tone curve.

The table below gives a general indication of how to use the controls:

Over Exposed Subject (thin transparency)	HL+ MT+ SH+
Under Exposed Subject (dense transparency)	SH- MT- HL-
Improve White Garments	HL+
Improve Snow Scenes	HL+
Improve Flat Subjects	SH- HL+
Improve Detail Overall	SH- HL+
Improve Shadow Detail	SH-
Improve Midtone Detail	HL+ MT+
Remove Detail Overall	SH+ MT- HL-
Heavier Result Overall	HL+ SH+

The $^{1}/_{4}$ Tone and $^{3}/_{4}$ Tone regions provide intermediate adjustments with may be suitable for certain applications.

There are two methods used to enter Tone changes.

- The **Tone** button functions

  These are principally used when performing one-off edits. Edits entered using this method can only be stored in CVs by storing the entire JV-block data.

- Permanent Tone Boosts (PTBS), CAL 10

  To set up tone edits for a series of scans, use CAL 10, Permanent Tone Boosts. PTBS edits can be stored in a CV using CAL 210, or recalled using CAL 110.

If Tone edits are specified and a PTBS is also entered or recalled, the scan will be modified by both sets of edit data.

12.1.2 Tone Button

Note: Enter White and Enter Black must be set before these buttons are used.

To select the Tone function:

Press: [TONE]

The Tone display appears with the Highlight tone region selected.

To step though each of the five tonal regions:

Press: [↔ NO]

Alternatively, to select the Highlight, Midtone or Shadow region:

Press: [HL] or [MT] or [SH]

To make a change in the selected region:

Use: [▽] or [△]

Or Enter: **n**

and Press: [ENTER]

To leave the Tone function:

Press: [TONE] again.

12.1.3 Permanent Tone Boost - (CAL 10)

Note: Enter White and Enter Black must be set before these buttons are used.

Press: [CAL]

Enter: **10**

Press: [ENTER]

PERM. TONE BOOST
HIGHLT 0

To step though each of the five tonal regions:

Press: [↔ NO]

Alternatively, to select the Highlight, Midtone or Shadow region:

Press: [HL] or [MT] or [SH]

To make a change in the selected region:

Use: [▽] or [△]

Or Enter: n

and Press: [ENTER]

To exit the CAL 10 function:

Press: [CAL]

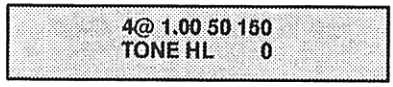
12.2 Channel Boost

Channel Boost has the same features as Tone but allows edits to be applied independently to each colour channel (C, M and Y), and does not affect neutrals. The Black channel can also be selected but the Black Tone function is described with other Black Printer controls in Chapter 13.

Note: Enter White and Enter Black must be set before these buttons are used.

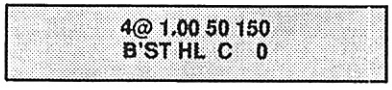
To select the Channel Boost function:

Press: [TONE]



Press: [C], [M] or [Y]

For example if **[C]** is selected the display will change to:



The tonal region can now be selected using the method described for Tone.

To edit the selected channel and tonal region, enter an index number and:

Press: [ENTER]

Any other tonal region can now be selected and edits performed.

Other channels can now be edited. To exit from Channel Boost:

Press: [TONE] again.

12.3 Neutral Tone Boost

This facility allows neutral or near-neutral tones to be changed while leaving coloured areas unchanged. C, M and Y channels are affected simultaneously by this function, which is similar to the conventional tone control.

The extent to which near-neutral colours are changed by the Neutral Tone Boost function can be controlled using the Neutral Selectivity function, CAL 25. For more information on Neutral Selectivity, see Section 12.13.

12.3.1 Setting the Gain

The level of Neutral Tone Boost in neutral areas can be changed as required. To access this facility:

Press: [TONE] then [↙]

```
4@ 1.00 50 150
NSTN HL   0000
```

To step though each of the five of the tonal regions:

Press: [↔ NO]

Alternatively, to select the Highlight, Midtone or Shadow region:

Press: [HL] or [MT] or [SH]

To make a change in the selected region, position the scan spot over the neutral tone which is to be boosted and view the Current Value Display. To adjust to the required dot %:

Use: [▽] or [△]

Or Enter: **n**

and Press: ENTER

To return to monitor mode:

Press: TONE

12.4 Catchlight

The Catchlight button, **[C/L]**, can be used to create 'highlight drop-out' effects on small sparkling areas. It is not intended to be used to give a clean break from one HL tone to another in the same manner that a HL mask could be used in conventional graphic arts.

You can enter a Catchlight value that will determine the lowest value of screen dot that will appear on film. Ideally that value will be equal to or lower than the lowest channel value at EW (so as to maintain the GB values for the EW point). Catchlight will affect dot % on all tones that are below Catchlight Breakpoint. Care should be taken not to introduce colour fringes (contouring).

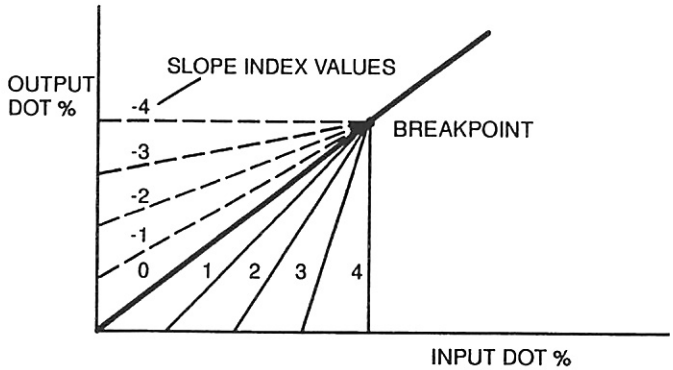


Figure 12.2 Catchlight - slope curves

Slope is the severity with which the Catchlight will be applied. Slope index values for catchlight values are from 0 to 4:

0 = No Slope, which renders Catchlight inactive

1, 2, 3, 4 = increasing levels of Slope.

Using a Slope of 4 will cause all screen dots to drop out below the Breakpoint that has been selected.

Slope index values -1 to -4 may occasionally be used for certain special effects.

12.4.1 Operation

Press: C/L

```
4@ 1.00 00 150
CL BKPT= 0
```

Enter the Breakpoint for the lowest channel and

Press: ENTER

```
4@ 1.00 00 150
CL SLPE= 0
```

Enter the Slope value and

Press: ENTER

The alphanumeric display will revert to normal monitor mode.

To inspect Breakpoint or Slope values without entering a value you can follow the sequence described above or alternatively:

Press: C/L then or

Any Catchlight setting can be stored as a CV, using CAL 217 or recalled using CAL 117.

12.4.2 Channel Selective Catchlight

Catchlight colour selectivity for a specific channel applies only to Slope. To access colour selectivity:

Press: C/L

```
4@ 1.00 00 150
CL BKPT= 0
```

Enter the breakpoint value for the lowest channel, i.e. for 5%:

Enter: 5

```
4@ 1.00 00 150
CL BKPT= 5
```

Press: [ENTER]

```
4@ 1.00 00 150
 CL SLPE= 0
```

After entering the breakpoint:

Press: [COLOUR]

```
4@ 1.00 00 150
Y CL SLPE= 0
```

The Yellow slope is displayed. Enter a slope value in range 0 to 4 (typically 3), i.e.:

Enter: **3**

```
4@ 1.00 00 150
Y CL SLPE= 3
```

Press: [ENTER]

```
4@ 1.00 00 150
M CL SLPE= 0
```

Enter slope for Magenta and Cyan channels similarly as for Yellow. After pressing **[ENTER]** for Cyan, the display returns to the monitor mode.

When the same slope is not specified for all colours an * will appear on the bottom line of the display:

```
4@ 1.00 00 150
* CL SLPE= 3
```

12.5 Limit

The gravure process requires that there should be no density in the separations higher than a specified maximum density. A similar requirement often exists for web offset or letterpress. The Limit control cuts off the tone in a picture at a specified dot %.

Upper (SH) and lower (HL) dot % limits can be set. Applying Limit will prevent any dot % from being either above the upper limit or below the lower limit.

Individual limits can be set in one or more colour channels Y, M and C. Alternatively, common limits can be set in Y, M, C channels. Black limits are always set separately. Black limit procedures are described in Chapter 13. It is not necessary to monitor the original in order to set limits.

If both **[SEP]** and Limit buttons are selected, the limit dot % values are shown on the Current Value Display.

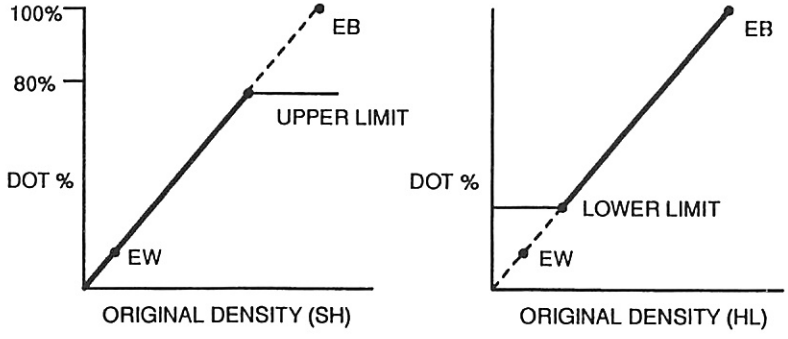


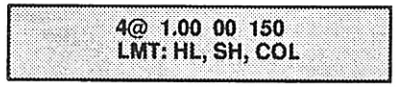
Figure 12.3 Limit curves

12.5.1 Operating Sequences

Common Limits

Ensure that the Y, M or C channel is selected.

Press:



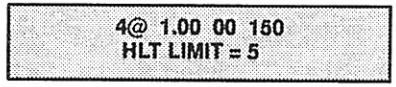
To change the common HL Limit in C, M and Y:

Press:

This negative limit default value is set at a very low level so as to have no effect under normal operating conditions.

Enter the required dot %, i.e. for 5%:

Enter: 5



To leave Limit mode:

Press:

To change the SH Limit in C, M and Y, use the same procedure as above but press **[SH]** instead of **[HL]**. Note that the SH Limit default value is set at a high level so that it will have no effect under normal operating conditions.

HL and SH limits can be used simultaneously to produce uniform tint blocks. Set the SH limit below the HL Limit. The SH Limit will override HL limit:

e.g. HL limit = 50%, SH limit = 45%, result = 45%.

Colour Selective Limits

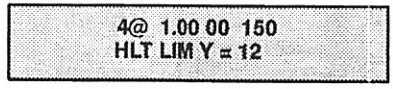
Press: and

Select the tone region, highlight or shadow, i.e.:

Press:

To set a new limit in Y, i.e. 12%:

Enter: **12**



To step to M limit:

Press:

or

The sequence will continue through C and B limits.

12.6 Line Mode

This mode is used if line work such as drawings or text is scanned. It is also used to create drop-out or burn-out masks and line boost masks.

A breakpoint (% dot value) is chosen by the operator. The scanner computer monitors the C, M, Y and B separation dot % values related to the picture area being scanned. Dot % values below the Breakpoint are changed to a constant lower limit value. Dot % values above Breakpoint are changed to a constant upper limit value. The operator can choose these limit values using the Limits functions, (before using the Line function). The upper and lower limit default values are 110% and -10%.

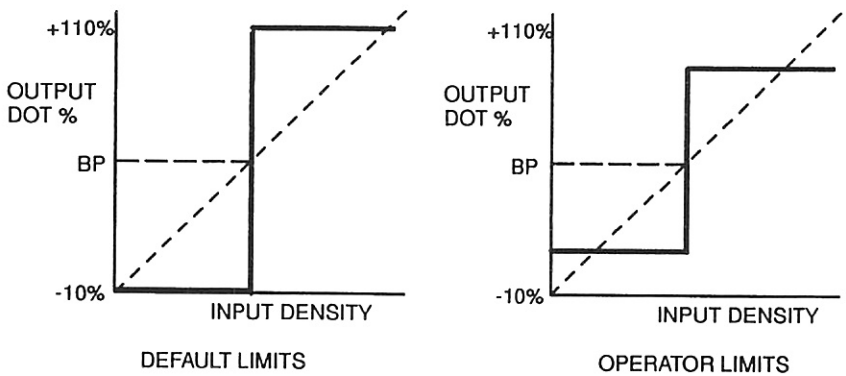


Figure 12.4 Limits

The picture signal entering the expose unit has only two values, which correspond to the upper and lower Limits of output dot %. With default Limits set a dot pattern is seen on separations only at the boundaries between high and low density areas.

This facility may enhance detail in some areas of separation and remove it in others, depending on the Breakpoint and Limits chosen. Experience will reveal the full potential of Line mode. A Breakpoint of 50% dot and -10/110% limits will give clean line work.

12.6.1 Operation

If you have set limits for a previous job, which are not needed in Line mode, remove them first. To enter Line mode:

Press: CAL

Enter: **509**

Press: ENTER

```
LINE MODE    OFF
CHANGE YES/NO ?
```

To change the current selection:

Press: ↕ YES

```
LINE MODE    ON
BP 0 - 100%  50
```

If **OFF** is selected the display returns to the monitor mode. If **ON** is selected you can now view the current settings.

To enter the default value:

Press: ENTER

```
4@ 1.00  00  150
AUT M LIN SN A2
```

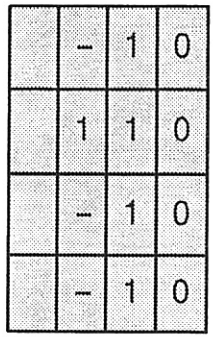
To change the Breakpoint value:

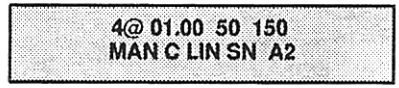
Enter: **nn**

Press: ENTER

```
4@ 1.00  00  150
AUT M LIN SN A2
```

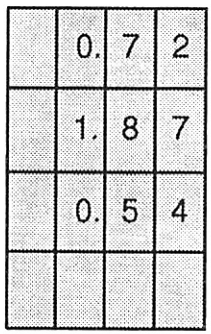
If **[SEP]** is selected, the Current Value Display will show the separation dot % in each channel, during exposure. The values will jump from the upper limit to the lower limit and vice versa, as the original density of the scanned area moves above or below the Breakpoint. The current values for each channel will be -10 or 110 unless Limits are selected in which case the Limit values will be used.

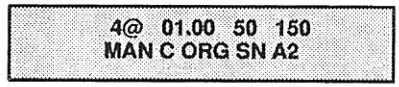




[SEP] selected

If **[ORIG]** is selected, the Current Value Display will show the original density in each channel, during exposure.





[ORIG] selected

12.7 Colour Negative Scanning

No stringent quality control is applied to normal colour negative processing, so the results of a scan are unpredictable. For this reason it is best to scan colour negatives only when it is possible to preview the scan results.

CAL 530 is not available from the Macintosh terminal, so the initial setup must be done at the scanner.

12.7.1 Procedure

1. Use CAL 530 to set NEGATIVE ORIGINAL working.

   Press: CAL

   Enter: **530**

   Press: ENTER — SCAN POS. ORIGN CHANGE Y/N

   Press: YES — To change the selection.

   Press: NO — To keep the current selection and leave the display.

2. Set analyse head on the pink rebate of the negative or, alternatively, on the lightest area of the negative image area.

3. Perform autobalance sequence (transmission copy). The value that the scanner shows in the current value display for original should be 3.90 in the autobalanced area.

4. Enter black in the rebate or lightest area. Alternatively, note the highest value found in the lightest area, and enter this in all three colours using CAL 29.

5. Enter white in the darkest area found. Alternatively, note the lowest value found in the darkest area, and enter this in all three colours using CAL 28.
6. Do a prescan to the Macintosh terminal.
7. Check that an image appears on the Macintosh display.

   Note: When scanning negatives, if the midtone values are consistently low, you may need to change the luminosity values.

   There is a luminosity curve for colour negative scanning available on the Macintosh terminal. This may be used if required.

8. Re-do enter white and enter black from the Macintosh terminal, using the best possible parts of the image.
9. Edit image to produce the desired result.

12.8 Luminosity Curves

Luminosity values are calculated for three types of originals:

- originals with a dark surround (35 mm etc.)
- originals with a light surround (mainly reflection copy)
- large transmission originals.

Average luminosity values have been calculated for the Basic Value program. These values, or other values at the customer's discretion, can be changed using CAL 503 and stored/recalled using CAL 253/153 respectively.

To change the Luminosity values:

Press: CAL

Enter: **503**

Press: ENTER

```
4@ 1.00 00 150
LMNSTY  1   10.00
```

Enter the first value and

Press: ENTER

```
4@ 1.00 00 150
LMNSTY  2   7.55
```

Repeat for each of the 16 values. After the last value has been entered the display returns to the monitor mode.

12.9 Print Density

The Print Density data now provides a tone shape which takes into consideration the dot gain. Any additional tone edits needed to match the customer's requirements are made in the normal way on the scanner front panel edit controls. Average Print Density values have been calculated for the Basic Value program. Other values can be loaded using CAL 504, and stored/recalled by CAL 213/113 respectively.

To change the Print Density values:

Press: CAL

Enter: 504

Press: ENTER

```
4@ 1.00 00  150
GB PD 1   -0.25
```

Enter the first value and

Press: ENTER

```
4@ 1.00 00  150
GB PD 2    0.06
```

Repeat for each of the 16 values. After the last value has been entered the display returns to the monitor mode.

12.10 Colour Correction

The six colour correction buttons are the colour retouching tools. They can be used for the following purposes:

- To make changes in parts of the original that are not the correct colour.
- To make changes in parts of the original which would otherwise reproduce poorly because of the type of original or the behavior of certain colours in the original.
- To change the overall colour correction information in the scanner to suit different inks.
- To install new colour correction Customer Values (CVs), or to change existing ones.

12.10.1 Selecting the Appropriate Controls

The colour correction buttons specify which colour in the original is to be adjusted and they are used singly in Y, M, C or B channels. The **[Y]**, **[M]**, **[C]** or **[B]** channel select buttons specify the separation which is affected by that adjustment.

The colour of the button that you use should be the nearest match to the colour that you are monitoring, e.g. to reduce magenta in greens you would monitor the green area and select the Green button and M channel. To increase yellow in greens you would monitor the green area and select the Green button and Y channel. In each case the dot % which you require can then be entered.

If you try to make an 'illegal' correction (e.g. monitoring a green area and trying to select a new dot % value in the C channel using the red colour correction button), the scanner will bleep three times and an error message will appear on the Alphanumeric Display.

Note: The above applies to direct entry of dot % values but not to the use of Increase or Decrease buttons.

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12.10.2 Entering Changes

Press: COLOUR

Press: Y, M, C or B

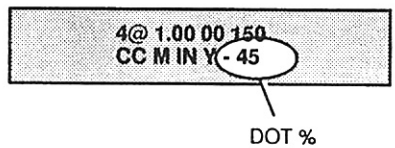
Press: Red HL, Yellow MT, Green SH, Cyan PCR, Violet CL or Magenta

Enter the dot %, i.e.: 45%:

Enter: **45**

Press: ENTER

or Use: △ or ▽



To see what change you have made, select the Separation display mode and:

Press: SUPP EDIT

This will temporarily suspend the selected colour correction edit to show the value before edit was applied.

Press **[COLOUR]** a second time to exit from the colour correction mode.

Any combination of colour correction settings you make can be stored in one of your CV blocks using CAL 212 and recalled using CAL 112.

12.10.3 Colour Correction and Installing CVs

Colour Correction

A good colour correction can only be achieved in calculated steps over a certain period of time. Observe the following rules:

- Under no circumstances should the colour correction be judged from results that have received selective editorial colour or tone changes.
- Changes in tone, grey balance, cast etc., will alter the colour correction (a point often overlooked).
- Do not judge the colour correction achieved on one subject only, but have as many jobs as possible proofed to get your final setting.
- Avoid frequent changes of colour correction as this will only cause confusion resulting in an incorrect assessment of the real problem.
- Always make the Black colour correction after the C, M and Y channels have been adjusted. (Changes in C, M and Y will also result in changes to the Black.)
- Remember that the colour correction is interactive, particularly if it is made to a dirty colour e.g. olive, brown, etc..

- Make the correction on a normal range transparency.

Note: A long/short range original may not give you the right colour correction. A long range transparency tends to have over-saturated colour correction while a short range transparency will be under saturated.

New Colour Correction CVs

1. Mount the Crosfield Colour Patch on the small cylinder, emulsion up and focus on clear cylinder to give repeatable and uniform readings.
2. Perform an Autobalance, then EW on the white patch (e.g. 5% in C) and EB on the black patch (e.g. 95% in C).
3. Use the colour correction edit facility to adjust the different colour patches.
4. When all the changes have been made, check all the different patches to ensure that changes made in one value have not affected other values.
5. Scan several jobs to verify the changes.
6. When the full set has been verified, the new set should be stored into CV, using CAL 212. Enter all the alterations into the Log Book.

Colour edits can be recalled using CAL 112.

12.11 Enhanced Colour

This function cleans pastel colours by reducing the dot % in the lowest two channels. It is particularly effective in cleaning colours such as browns and greens. The effect will be most noticeable in desaturated colours where the lowest channels have high densities.

Before selecting the Enhanced Colour function the Colour Reduction Curve functions can be specified if required. See later in this section.

12.11.1 Specifying Enhanced Colour Correction

To perform a correction:

Press: COLOUR

Press:

ENHANCED COLOUR
GREEN 0.00

Position the scan head over the colour you wish to edit, then select the closest channel. For example, to edit a brown, press the **Red** key.

Press:

Red	Yellow	Green	Cyan	Violet		Magenta
HL	MT	SH	PCR	C/L	or	

Enter a 3-digit decimal factor between 0.00 and 2.00 to apply colour correction to selected colour and:

Press: ENTER

To return to the monitor mode:

Press:

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12.11.2 Specifying the Colour Reduction Curve

The Colour Reduction Curve determines the effect of enhanced colour correction at different saturation levels, It is set up during installation. It is equally applicable to any selected channel and cannot be varied for individual colours. The curve values defined in the table below may be called up on the Alphanumeric Display using CAL 518. New values can be entered but changes are not recommended unless you fully understand this function:

Press:

Enter: **518**

Press:

Step though each value and change as required.

To leave the display:

Press:

12.12 Pastel Colour Boost

This function increases the density of the highest colour channel of all desaturated colours while leaving neutrals and highly saturated colours unaffected. It is calculated from the highest dot % after removal of the neutral component and thus approximately depends upon the difference between the highest and lowest of the three dot %.

It affects both light and dark colours of low saturation but the effect is greater on pastel colours. The control affects colours where the difference between the highest and lowest is below 40% with the greatest effect at approximately 15%.

Before selecting the Pastel Colour Boost function the Pastel Boost Mode and Pastel Boost Curve functions can be specified if required. See later in this section.

12.12.1 Specifying Pastel Colour Boost

To specify Pastel Colour Boost:

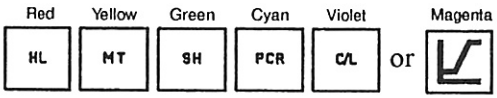
Press:

Press:

To apply to all colours simultaneously, unless already set to the default:

Press:

To apply to specific colours:

Press: 

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If you have previously selected all colours using **B**, you will have to exit (press **[COLOUR]** twice) and re-enter the Pastel Colour Boost function to access individual colours.

Enter a 3-digit decimal factor from 0.00 to 2.00 for the proportion of pastel boost required (BV = 0.20) and

Press: ENTER

Repeat the above procedure until the desired amount of dot % is achieved in the higher two channels.

To return to the monitor mode:

Press: COLOUR twice.

12.12.2 Selecting the Pastel Boost Mode

The CAL 516 Pastel Mode facility allows selection of All Pastels, Clean Pastels or Dirty Pastels.

Press: CAL

Enter: **516**

Press: ENTER

```
SET PASTEL EDIT
0=ALL PASTELS
```

To select	All Pastels,	Enter: **0**
	Clean Pastels,	Enter: **1**
	Dirty Pastels,	Enter: **2**.

Press: ENTER

The pastel categories are:

Category	Description
All Pastels (Option 0)	Any colour which falls within the bounds of the pastel curve will be affected by a boost. This option is also the default condition.
Clean Pastels (Option 1)	Only colours with a low grey component will be affected by a boost.
Dirty Pastels (Option 2)	Only colours with a high grey component will be affected by a boost.

Note: Selection of 'Clean' or 'Dirty Pastels' may require a higher boost factor to be applied than would otherwise be the case if 'All Pastels' is selected.

12.12.3 Specifying the Pastel Boost Curve

The Pastel Boost Curve determines the effect of Pastel Boost at different saturation levels. It is equally applicable to any selected channel and cannot be varied for individual colours. The curve values defined in the table below may be called up on the Alphanumeric Display using CAL 513. New values can be entered but changes are not recommended unless you fully understand this function:

Press: CAL

Enter: **513**

Press: ENTER

```
4@ 1.00 00 150
PASTEL R   0.00
```

Pastel Curve Step	Curve Values
1	0.0
2	1.43
3	3.46
4	2.12
5	1.14
6	0.68
7	0.31

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Pastel Curve Step	Curve Values
8	0.11
9	0.0
10	0.0
11	0.0
12	0.0
13	0.0
14	0.0
15	0.0
16	0.0

12.13 Cast

This is a retouching feature that is used to remove or introduce casts. It can also be used after scanning as a re-scanning or final correction tool; where a separation is found to be up or down in Y, M or C (after proofing for example). To correct the fault, set the scanner up to the JV previously used but apply Cast at the appropriate stage in the procedure. There are two Cast buttons which are both channel selective. **[CAST 2]** must be used before **[CAST 1]**.

[CAST 2] is used to remove or add Y, M or C individually to neutrals in the Shadows only, without affecting colours. For example, Shadow is too brown and needs Cyan to make it nearer to neutral.

The extent to which near-neutral colours are changed by the Cast 2 function can be controlled using the Neutral Selectivity function, CAL 25. For more information on Neutral Selectivity, see Section 12.13.

[CAST 1] is used to remove or add Y, M or C casts independently in each colour channel, in the Highlight, Midtone and/or Shadow areas. It affects all areas of the subject simultaneously whether they are coloured or neutral. Note that a linear shift is achieved with the use of Highlight and Shadow Cast (see Figure 12.5).

12.13.1 Alternatives to Cast 1 and Cast 2

It is not necessary to use Cast unless:

- Use of EW and EB does not give the desired result.
- You wish to introduce a cast.
- You wish to remove an overall cast.

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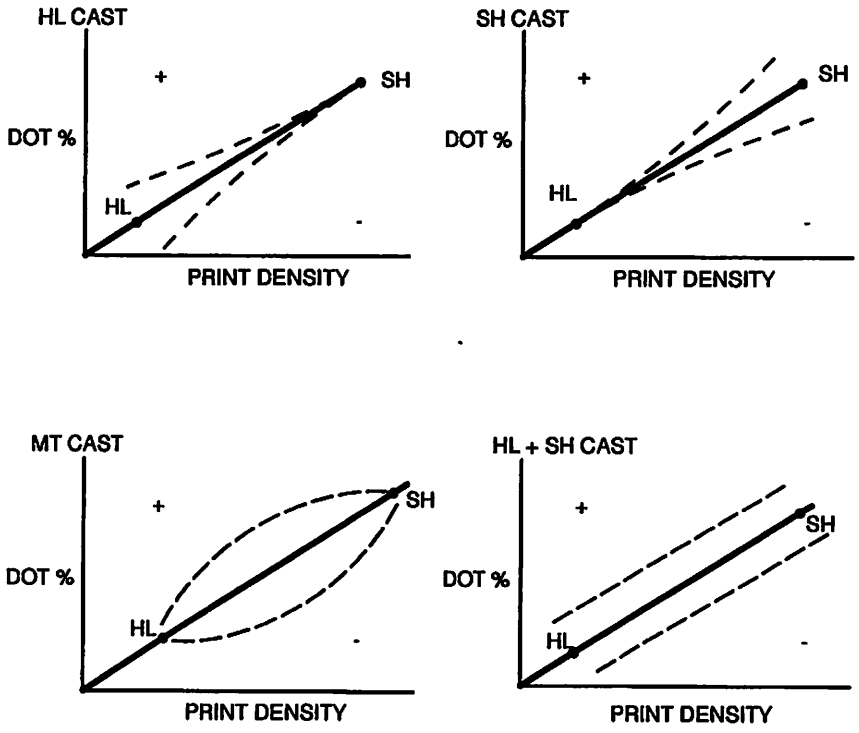
Remember that facsimile reproduction can mean:

- as the scanner sees it - scanner facsimile
- as the observer sees it - observer facsimile.



KEY TO GRAPHS

THE SEP DOT % BEFORE USE OF CAST

THE EFFECT OF USING CAST, (MAXIMUM EFFECT)

HL = HIGHLIGHT OR FIRST PRINTING TONE

MT = MIDTONE

SH = SHADOW TONE

Figure 12.5 Cast curves

To obtain scanner facsimile:

Press: MANUAL then ENTER WHITE

To obtain partial neutralization of HL casts, approximating to observer facsimile:

Press: AUTO then ENTER WHITE

To obtain total neutralization of HL casts, giving observer facsimile:

Press: AN then ENTER WHITE

To obtain scanner facsimile when C is highest in ORIG mode:

Press: MANUAL then ENTER BLACK

To obtain scanner facsimile when M or Y is highest in ORIG mode:

Press: AUTO then ENTER BLACK

To obtain total neutralization of SH casts, giving observer facsimile:

Press: AN then ENTER BLACK

12.13.2 Operating Sequences

Note: Enter White and Enter Black must be set before these buttons are used. **[CAST 2]** *must always be selected before* **[CAST 1]**.

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Cast is placed near the end of the operating sequence so that:

- it can be used as a retouching tool to correct work
- all of the edit functions interact properly
- if Cast is needed to adjust the Tone curve when the correct use of EW and EB has failed, Cast will not interfere with the other edit controls.

Suppose you wish to make obvious changes to an original, which cannot be achieved by use of EW and EB. Use the Cast edit immediately after EW and EB to produce the reproduction characteristic desired. Then, proceed through the other edit functions you wish to use. When you reach the Cast stage in the operating sequence check the transparency again and make any further adjustments necessary.

12.13.3 Cast 2

When you select **[CAST 2]** the scanner knows that the Shadow should be monitored. You do not need to select **[SH]**.

Press: [CAST 2]

```
4@ 1.00  00 150
SHD C CS2    2
```

Select: [Y] or [M] or [C]

Enter: **nnn**

and Press: [ENTER]

or Use: [Δ] or [∇] until the value is achieved.

nnn is an index number relating to the change in the extreme shadows of the selected colour. The maximum change is ±40%.

To leave Cast 2:

Press: [CAST 2] again.

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12.13.4 Cast 1

[CAST 1] must be entered separately for HL, MT and SH. You might use the buttons in the following order:

Press: [CAST 1]

```
4@ 1.00 50 150
HLT C CAST   0
```

The Highlight region is selected. To select a different region:

Press: [MT] or [SH]

Press: [Y] or [M] or [C]

Enter: **nnn**

Press: [ENTER]

or Use: [Δ] or [∇]

nnn is an index number relating to the change in the selected tonal region and colour.

For Cast 1 at the HL, to affect two colour channels you can:

Press: [CAST 1]

Press: [HL] and [M]

Use: [△] or [▽]

Select: [C]

Use: [△] or [▽]

To exit from the Cast 1 mode:

Press: [CAST 1] again.

12.13.5 Cancelling Cast Edits

After leaving Cast it is possible to cancel edits:

Press: [CANCEL EDIT] to clear all Cast settings.

Press: [ENTER WHITE] to clear Cast 1, HL and MT.

Press: [ENTER BLACK] to clear Cast 1 (SH and MT) and Cast 2.

12.13.6 Example of Operation

Suppose a transparency has a magenta cast. The customer requires the cast to be reduced slightly but not removed. Select the MAN EW mode to maintain the balance of the transparency, and set the scanner to put 5% dot in the lowest channel at the first printing tone.

This might give: Y = 5% dot
M = 25% dot
C = 8% dot.

You think you should reduce the M value to 15%. You have already tried AUTO EW but have not achieved the correct result.

You **cannot** reduce the M value from 25 to 15% by entering 15% via the keypad, You must either use or to enter the appropriate Index number.

Use with M channel selected so that the M value falls. Stop when the value reaches 15%. The Alphanumeric Display will show an Index number of about -10.

12.14 Setting the Neutral Selectivity

The extent to which Neutral Tone Boost and Cast 2 functions affect near-neutral colours can be controlled using the Neutral Selectivity function, CAL 25.

Press: [CAL]

Enter: **25**

Press: [ENTER]

Proceed through the CAL 25 sequence to step 3 (appearing on lower line of Alphanumeric Display):

Press: [ENTER] or [▽] three times.

To change the selectivity:

Enter: **n** the required value.

Press: [ENTER]

Note: The value of **n** *must be within the range 1 to 7. The BV is 5.*

Grey Balance and Black Printer 13

This chapter describes the procedures used to set-up grey balance for the printing process to be used. It also describes the range of adjustments which can be used to specify the black printer characteristics.

The black printer will also depend on the UCR or PCR settings. These functions are described in Chapter 14.

13.1 Grey Balance

A basic requirement of colour printing is to reproduce greys using Cyan, Magenta and Yellow inks. Three colour overprints of equal dot % values will usually produce brown, not grey. To reproduce grey the values for the scale have to be adjusted or 'grey balanced'. The extent of balancing required depends on the inks, press and paper used. This problem may not occur in gravure printing as the inks used can be balanced.

This data is obtained by outputting the grey-balance test-forme through each printing process. The grey-balance test-forme consists of a set of separation positives. These separations are used to produce printing plates which are then proofed using standard proofing conditions.

This section describes the procedures which must be performed to obtain the data required.

13.1.1 The Grey Balance Test Forme

The test forme is divided into two parts. One part consists of 10 blocks, each having a constant Cyan dot with varying Magenta and Yellow. This is the part of the test forme for grey-balance assessment.

Each block is divided into 25 separate areas by a grid printed in black ink. The purpose of this is to act as a neutral reference and is designed to have a density approximately the same as the neutral area formed by the three colour overprint. If the two are identical the three-colour grey and that produced by the Black ink will be virtually indistinguishable from a reasonable viewing distance. This will then produce a simple reference as to which area is a three-colour neutral.

The grey balance is determined by choosing an area within each block which produces the closest to a visual neutral. It should be assessed under standard viewing conditions. Generally, individual observers disagree on the precise area because by its nature the proof has an array of areas all very close to neutral. However, the disagreement is rarely significant. If more than one observer makes the assessment an 'average' of their results may be used.

13.1.2 Grey Balance Set-up Procedure

Once the proof of the test forme has been obtained the set-up procedure for grey balance is performed in the following sequence:

1. Select the C channel and enter CAL 13. Record the 16 cyan dot % values. These are found by stepping though the display using the **[ENTER]** key.

2. Begin the construction of a grey-balance graph by entering the CAL 13 values on the vertical axis and drawing the diagonal line at a convenient angle, as shown in Figure 13.2.

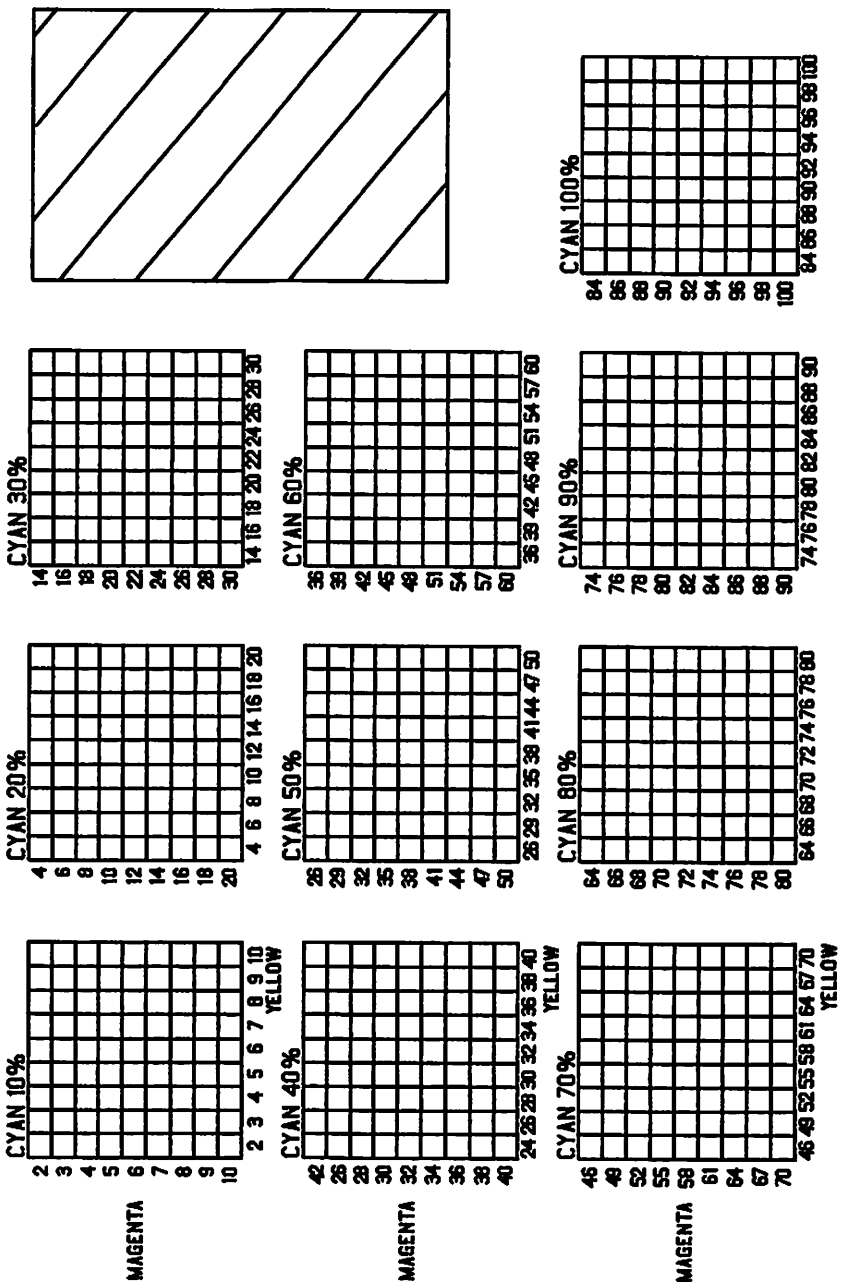


Figure 13.1 Grey balance test forme

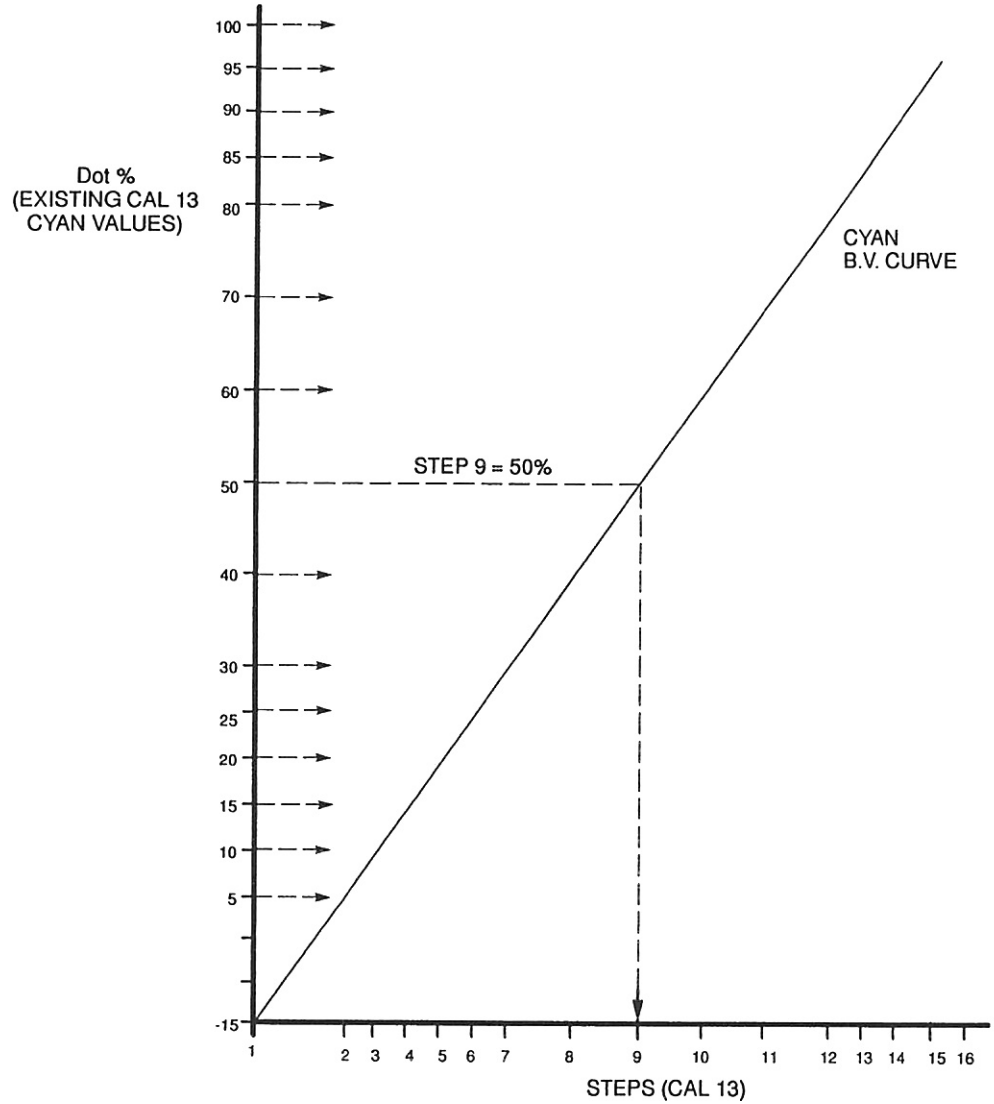


Figure 13.2 Creating the grey balance graph

3. Next, draw horizontal lines from each CAL 13 value until they reach the diagonal line, then project them vertically until

they cross the horizontal axis. Label the points of intersection of each of the 16 steps. Step 9 is shown as an example.

4. Examine the proof under 5000 K lighting, and from each of the ten blocks select and note a square which is most neutral in appearance (see Grey Balance Test Forme, Figure 13.1).

5. For the ten squares thus selected, record the dot % values of the cyan, yellow and magenta. A properly calibrated densitometer must be used to measure the exact values from the originally supplied separations, since the values shown on the test form illustration are approximate.

6. You can now create the magenta and yellow curves by plotting the dot % values for each neutral square.

7. For each block:

   a) Mark the cyan dot % on the vertical axis and project a line horizontally until it crosses the Cyan BV diagonal. Then project it vertically towards the horizontal axis.

   b) On this vertical line, mark the magenta and yellow dot % values.

   An example for neutral square 4 is shown in Figure 13.3.

8. When all data from the neutral blocks have been entered, draw a smooth curve through all magenta points, then all yellow points.

9. From the yellow and magenta curves thus produced, read off the corresponding dot % for each of the 16 steps. An example for step 11 is shown in Figure 13.4.

10. Select the M channel and enter the magenta dot % values in CAL 13. Select the Y channel and repeat the procedure for the yellow dot % values.

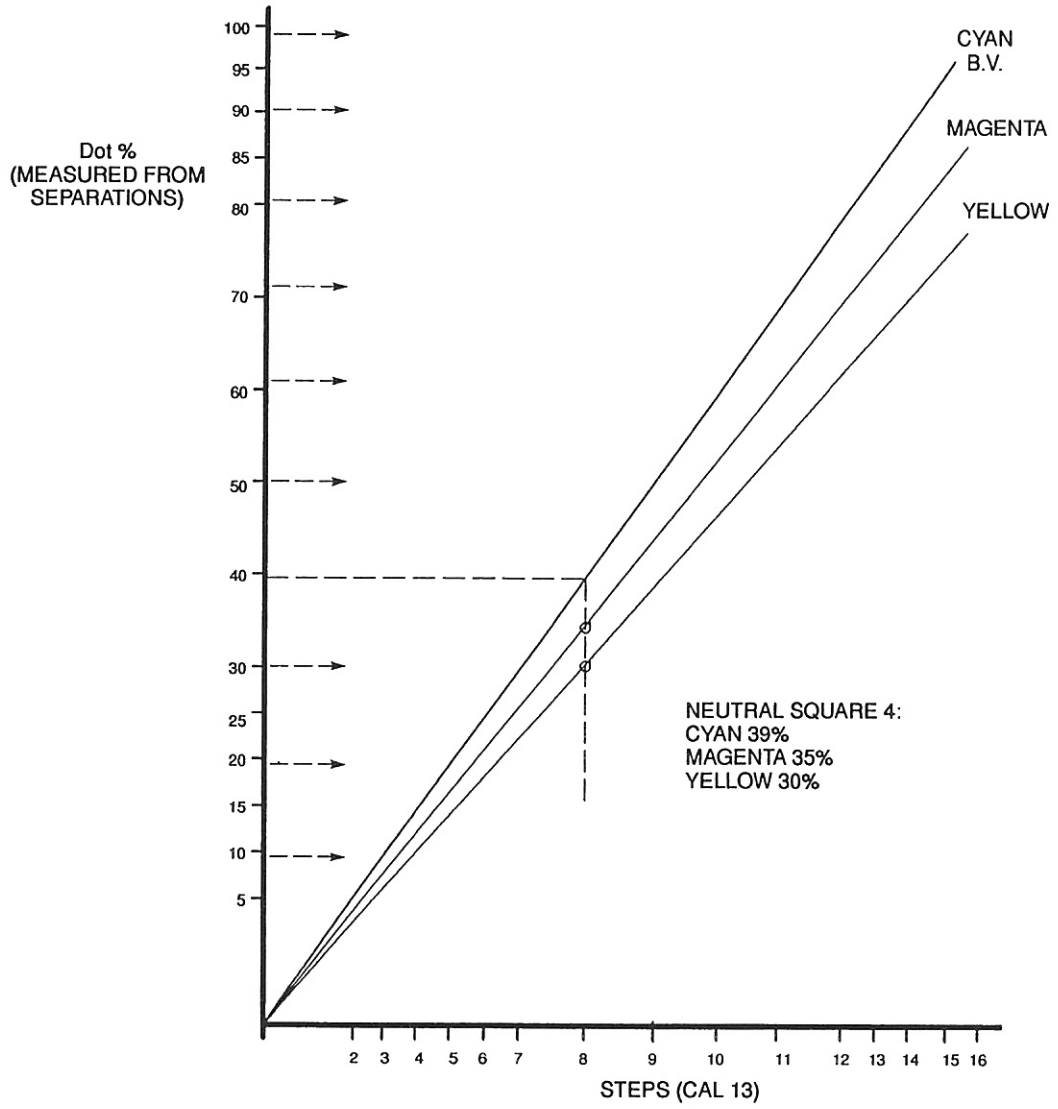


Figure 13.3 Plotting the magenta and yellow curves

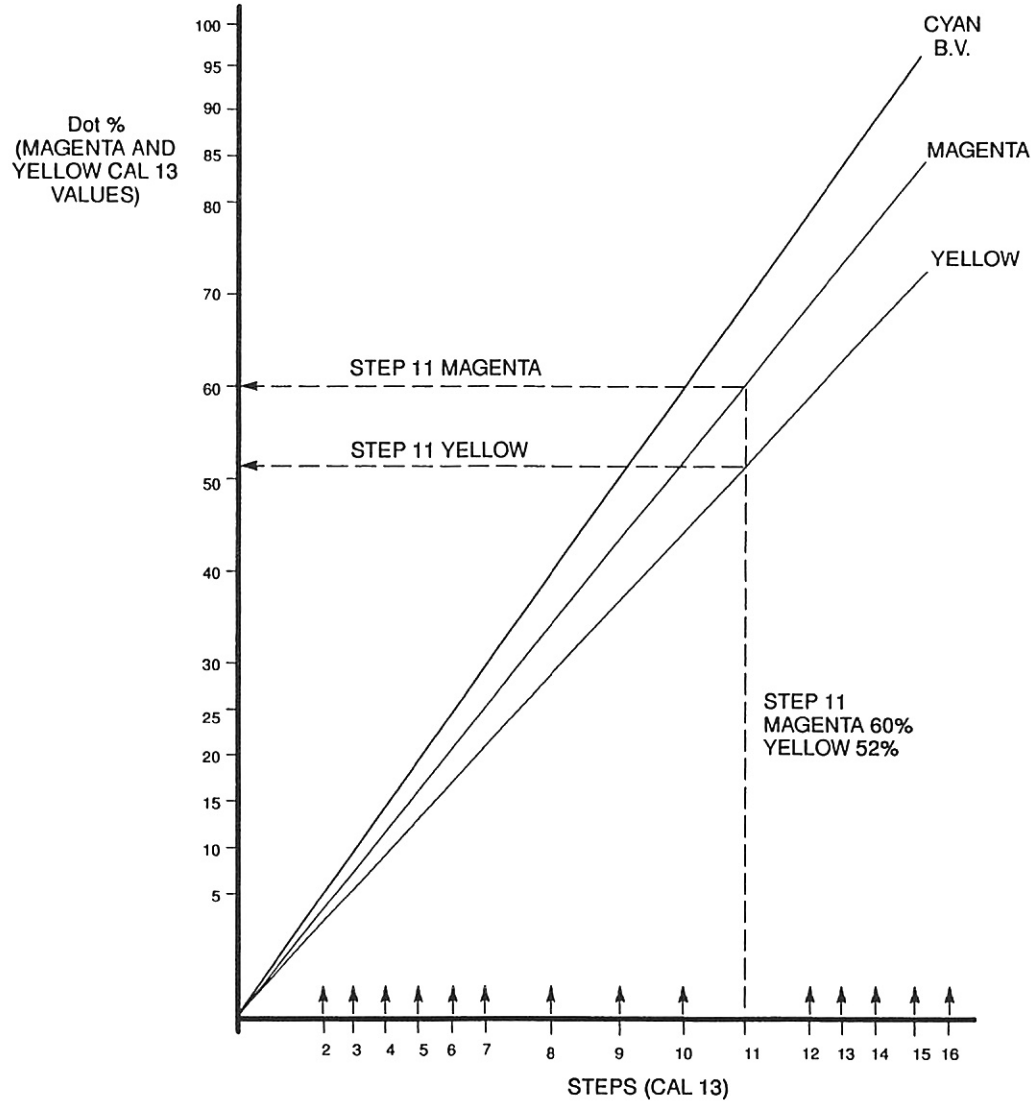


Figure 13.4 Finding CAL 13 dot % values for magenta and yellow

13.2 Grey Balance Window

The grey-balance window function, CAL 506, allows you to control the extent to which colour edits will alter the neutral greys.

To view or change the grey-balance window:

Press:	CAL	
Enter:	506	
Press:	ENTER	4@ 1.00 00 150 GB.SELEC= 1.00
Press:	ENTER	

To change the extent of the grey balance control, enter a value between 0.0 and 2.0.0 will allow the full effect of colour edits on neutrals. With 2 selected the grey balance of neutrals will not be affected by colour edits. The default value is 1.0.

13.3 Black Printer

The end points of the Black Printer tone range are automatically set relative to the Cyan when entering the CMY EW and EB points. The offsets from the Cyan and the curve shape between the end points can be adjusted using the Black Printer controls:

- The most common method of adjusting the Black Printer is to use the MAN EW and MAN EB in the Black channel. This control will only alter the end points of the Black relative to the Cyan and will be effective for one job only.
- An alternative is to use the CAL 11 to set the end points of the Black Printer. The curve shape can then be changed between these end points using Black Tone edits. These procedures can be used for changes to single images. They can also be made permanent using the CV store and recall functions, CAL 211

Further Black Printer controls are available using CAL 514 and CAL 13. These controls are used when setting up a scanner and should not be regarded as editorial functions.

13.3.1 MAN EW and MAN EB in the Black Channel

To change the offset values using the 'MAN EW/MAN EB in the Black channel' procedure:

Press:

Press:

and enter the required values of EW and EB as described in Section 7.3.

The Black Printer cannot exceed the maximum C shadow dot % unless MAN EW or MAN EB is used. Any later entry of EW or EB in Y, M or C will restore the automatic Black Printer image

even if you have entered a modified black. Offset and slope will return to the last-used CV.

13.3.2 Offset and Slope - CAL 11

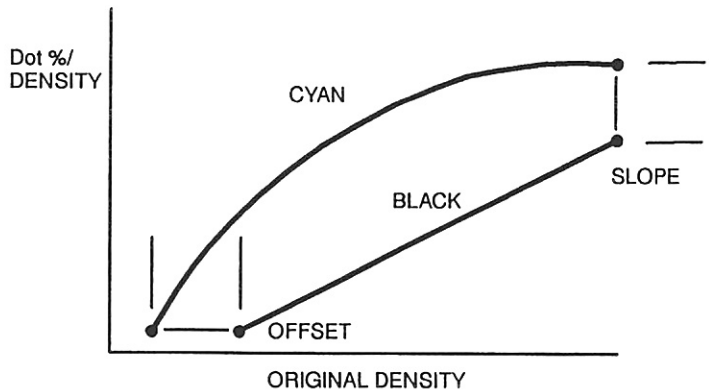


Figure 13.5 CAL 11 offset and slope

The CAL 11 facility performs the same function as 'MAN EW/EB in the Black channel' but the end points in this case are defined with offset values:

- The 'Black Offset' determines the starting point of the Black compared to the Cyan.
- The 'Black Slope' determines the upper end of the Black compared to the Cyan.

Press: CAL

Enter: 11

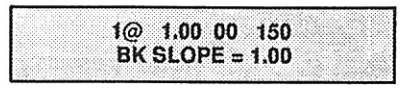
Press: ENTER

```
1@  1.00 00  150
BK OFFSET = 0.20
```

To change the offset:

Enter: **n.nn**

Press: [ENTER]



To change the slope:

Enter: **n.nn**

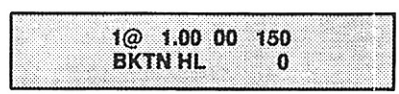
Press: [ENTER]

13.3.3 Black Tone

Black Tone control includes Highlight and Shadow in addition to Midtone. The function uses the same Tone envelopes as normal Tone. The operating sequence is:

Press: [TONE]

Press: [B]



To step though each of the three tonal regions:

Press: [↔ NO]

Alternatively, to select the Highlight, Midtone or Shadow region:

Press: [HL] or [MT] or [SH]

To make a change in the selected region:

Use: [▽] or [△]

Or Enter: n

and Press: ENTER

To return to monitor mode:

Press: TONE

13

13.3.4 Black Curve - CAL 514

The Black Curve is produced from three values:

a) The grey-balanced tri-colour overprint density is obtained from the square on the 100% cyan block of the grey-balance test-chart which is assessed as being closest to neutral. This square will already have been identified if you have previously performed the grey-balance procedure. Measure the reflection density of this square through the visual filter.

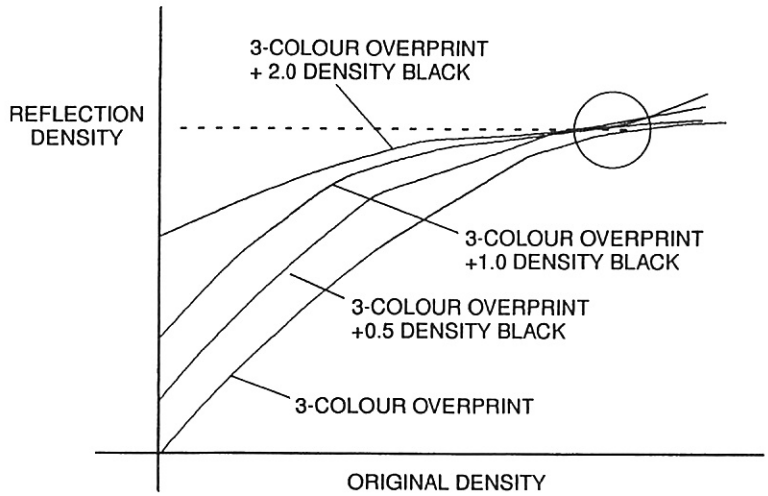
b) The second measurement is made from the grey-balanced, three-colour overprint plus black. This value should be obtained by measuring a patch made up of the same C, M, Y dot % values used for the tri-colour but which also has a black overprint. There is no such area on the test chart but the non grey-balanced three-colour overprint plus black can be used as an alternative. Measure the step which has a cyan dot of 100%.

c) Additivity failure is defined as the inequality produced between adding the individual ink densities and measuring the combined ink density value. The value of additivity failure is the third figure required for the black curve.

   To obtain this figure it is necessary to construct a graph of data obtained from the test chart. The graph consists of a series of curves. Each curve plots the rise in density of a grey-balanced, three-colour overprint. The difference between the curves is the level of black overprint. The value you will

need to find is the reflection density where all curves converge.

In practice, these curves will not all pass through a single point. You will need to find the best estimate of the point of convergence and read off the corresponding reflection density.



To enter the three values:

Perform Enter White using **[CAL] 28** and Enter Black using **[CAL] 29**.

Enter: **[CAL] 514**

Press: ENTER

```
4@ 1.00 00 150
D.MAX  1  1.49
```

Enter: value (a)

Press: ENTER

```
4@ 1.00 00 150
D.MAX  2  1.92
```

Enter: value (b)

Press: ENTER

```
4@ 1.00 00 150
D.MAX  3  2.00
```

Enter: value (c)

Press: ENTER

The display returns to the monitor mode.

13

13.3.5 Black Grey Balance - CAL 13

While CAL 514 determines the Black by taking into account the ink densities, the final shape of the curve may still not be exactly that required.

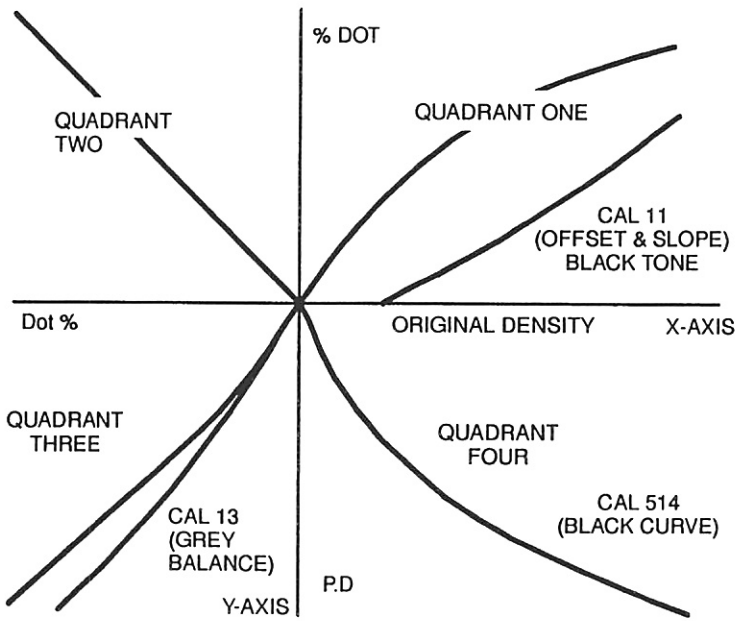


Figure 13.6 Quadrant diagram

Using the logical sequence of making changes, the Black gradation can be changed by CAL 13 (Grey Balance) in the Black Channel. The advantage of CAL 13 is that it allows 14 working

points of change to be made to the curve, two of which are extrapolated. However, a quadrant diagram has to be plotted to make such changes to the curve. You will not usually need to make this adjustment.

Press: [B] if **B** not already selected.

Enter: **13**

Press: [ENTER]

```
4@ 1.00 00 150
GB   Y%  1 -10
```


The display appears, ready for the first entry. Starting with the lowest, enter the 16 values, pressing **[ENTER]** after each. After entering the last value the display returns to the monitor mode.

13.3.6 Black Limits

Limits can be applied to the Black printer highlights and shadows in the same way as the three colour channels.

Press: [B] if **B** not already selected.

Press: [⌐]

```
4@ 1.00 00 150
LMT: HL, SH, COL
```

To change the Highlight Limit:

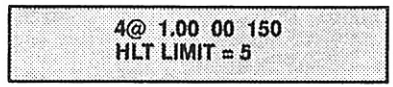
Press: [HL]

```
4@ 1.00 00 150
HLT LIMIT =  -10
```

This negative limit default value is set at a very low level so as to have no effect under normal operating conditions.

Enter the required dot %, i.e. for 5%:

Enter: **5**



To leave Limit mode:

Press: ENTER

13

To change the Black Shadow Limit, use the same procedure as above but press **[SH]** instead of **[HL]**. Note that the Shadow Limit default value is set at a high level so that it will have no effect under normal operating conditions.

UCR and PCR 14

This chapter describes the procedures required to specify Under Colour Removal and Polychromatic Colour Removal.

14.1 Under Colour Removal

Under Colour Removal (UCR) is defined as the reduction of three-colour ink in neutral and near neutral shadow areas. The black separation is increased to exactly compensate for the reduction in the other three colours.

14.1.1 Switching On UCR and Changing Breakpoint and Slope

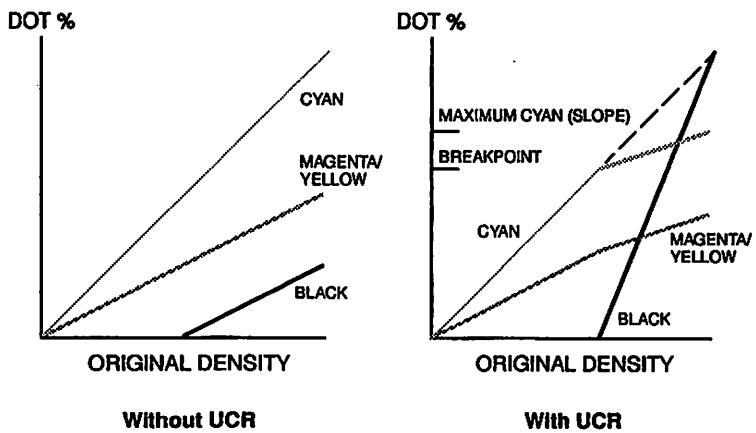


Figure 14.1 UCR breakpoint and slope

The Breakpoint is the dot % on the cyan channel where UCR commences.

The Slope determines how much UCR will be applied at and above the breakpoint.

CAL 515 is used to switch on UCR and to specify the Breakpoint and Slope values.

Before proceeding with the CAL sequence, set up the job and perform all other edits. Position the Enter Black point under the analyse head.

14

Press: CAL

Enter: 515

Press: ENTER

```
4@ 1.00 00 150
UCR  ? Y/N
```

Press: ↕ YES

```
4@ 1.00 00 150
UCR BKPNT=  0
```

Enter the Breakpoint, valid entries are from 0 to 100%. For example, to enter a Breakpoint of 45%:

Enter: 45

```
4@ 1.00 00 150
UCR BKPNT= 45
```

Press: ENTER

```
4@ 1.00 00 150
UCR SLOPE= 01.00
```

The Slope display appears indicating the current Slope Index. The Slope is specified by entering the maximum dot % which the cyan is to reach in the shadows. For example, to enter a maximum dot of 80%:

Enter: 80

```
4@ 1.00 00 150
UCR SLOPE= 80
```

Press: [ENTER]

```
4@ 1.00  00  150
UCR Y ORG SN A2
```

After the value is entered the scanner calculates the new Slope Index number. If CAL 515 is re-entered the Slope Index will be displayed, not your dot % entry.

If PCR has also been selected, **U+P** will be displayed instead of **UCR**.

14.1.2 Changing UCR Selectivity and Black Compensation

UCR Selectivity determines whether UCR will be applied only to pure neutrals or will include dirty colours.

Black Compensation determines the amount of black which will be added for a certain reduction in cyan. Black Compensation is also used with PCR.

CAL 14 is used to specify Selectivity and Black Compensation.

Press: [CAL]

Enter: **14**

Press: [ENTER]

```
4@ 1.00  00  150
UCR SELEC= 1.00
```

The entry range is from 0.00 to 2.00. At 0.00, UCR will only be applied in pure neutrals. The maximum use of UCR in dirty colours will be obtained with entry of 2.00. The default value is 1.00.

Always enter the decimal point and at least the first decimal place, i.e.:

Enter: **1.2**

```
4@ 1.00  00  150
UCR SELEC =1.2
```

Press: [ENTER] → 4@ 1.00 00 150 / BL COMP = 1.00

The Black Compensation display appears. At the Black Compensation Basic Value of 1.00 every 10% of cyan removed is replaced with 10% of black ink. At a value of 0, no extra black will be added to compensate for the colour removed.

The data for Black Compensation is obtained from the grey-balance test-chart.

1. When calculating grey balance, the Cyan dot % of 10 neutral steps will have been measured. The reflection densities of these steps should now be measured using a visual filter and an accurately calibrated densitometer.
2. Plot a graph of the reflection densities against the Cyan dot % values which produced them. See the graph opposite.
3. Using the same proof, find the black greyscale and measure the steps. Again use a calibrated densitometer set up with the visual filter.
4. Plot another curve on the graph from the results obtained.
5. Choose three densities on the graph which are in the midtone to shadow area. Read off the corresponding Black and Cyan dot %values for each point.
6. Divide the Black dot % by the Cyan dot % for each density.
7. Find the average of the three values to an accuracy of three decimal places.
8. Enter this value in the **BL COMP** display of CAL 14.

For example to enter 0.92:

Enter: **0.92** → 4@ 1.00 00 150 / BL COMP = 0.92

Press: [ENTER] → 4@ 1.00 00 150 / UCR C ORIG SN A2

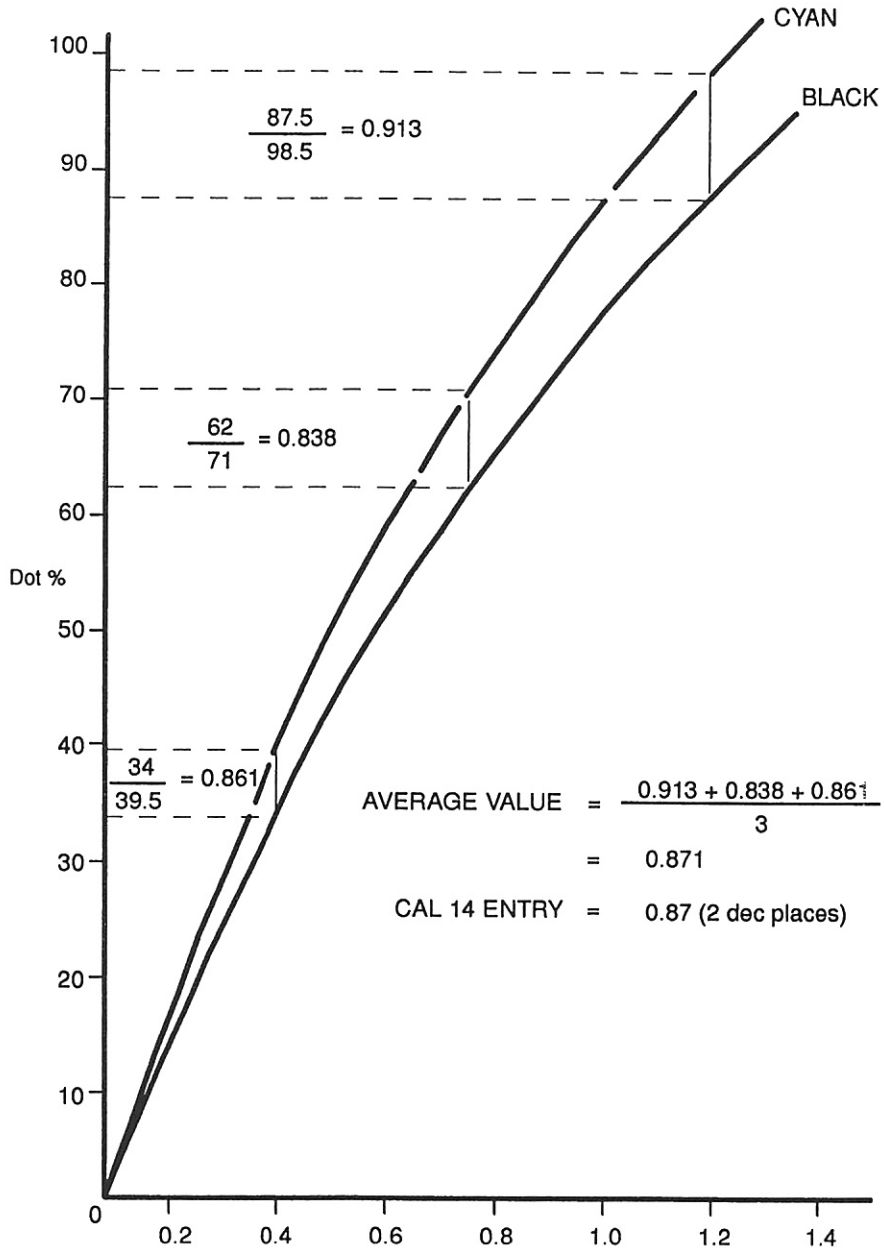


Figure 14.2 Black compensation graph

UCR will only appear in the display if UCR has been switched on using CAL 515.

14.1.3 Switching Off UCR

The UCR values which were entered using CAL 515 and CAL 14 will be lost.

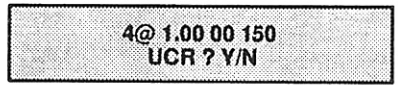
To proceed:

14

Press: CAL

Enter: 515

Press: ENTER



Press: ↔ NO

Note: UCR does not show as an edit.

14.2 Polychromatic Colour Removal

PCR is defined as 'the removal of the neutral component in any colour and its replacement by the black printer'. It is also known as Grey Component Replacement (GCR).

When a colour is separated into its three component colours, the lowest channel and equivalent levels of the other two colours, only affect the grey component of the colour. Using PCR will effectively replace this neutral colour with black and re-proportion the component colours to give the original colour. This means that when three colours are overprinted one of them will always be black.

For acceptable reproduction using PCR it is essential that grey balance is accurately set up for the appropriate printing conditions. A detailed procedure for the adjustment of grey balance and other printing parameters is described in Section 13.1.

Once the scanner has been set up to the appropriate printing condition the following basic procedure can be used to specify the level of PCR required on a particular job.

Note: Selection of PCR does not cause the **CANCEL EDIT** *button to light if it has been saved in a CV.*

14.2.1 Basic PCR Operating Procedures

Setting PCR using the Gain Method

Press: [PCR] → 4@ 1.00 00 150 PCR ? YES/NO

Respond: [↕ YES] → 4@ 1.00 00 150 PCR GAIN 1.00

Enter a 3-digit decimal value between 0.00 and 1.00 for the proportion of PCR required (BV = 1.00) and

Press: ENTER

If UCR has also been selected, **U+P** will be displayed instead of **PCR**.

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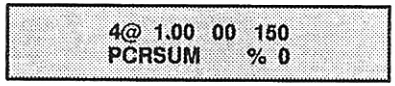
Setting PCR using the Maximum Overprinting Method

For maximum overprinting of ink weights as a dot %, enter a 3-digit value for ink weight maximum dot %. Select PCR as described in the previous section, enter a minimum gain, 0.01, then proceed as follows:

Set up the scanning head on a solid tone, then:

Press: CAL

Enter: **65**



Enter: **240**

Press: ENTER

The scanner will calculate the right gain to give the PCRSUM %.

14.2.2 PCR Editorial Procedure

For editorial use the weight of black can be balanced with the weight of the colour under black.

Limiting Black

To increase or decrease the weight of black:

Press: CAL

Enter: 524

```
4@ 1.00  00  150
PCR BLACK 1.00
```

Enter new value (BV = 1.00) and

Press: ENTER

Repeat the above procedure until the desired weight of black is achieved.

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Adding Three-colour Under Black

Note: It is recommended that CAL 524 be set before CAL 523.

Three-colour inks can be added to reinforce the black printer where additional density is required in shadow areas.

Press: CAL

Enter: 523

```
4@ 1.00  00  150
PCR OFST %  100
```

Enter the break point as a dot % (BV = 100%) and

Press: ENTER

Repeat the above procedure until the desired weight of colour under black is achieved.

14.2.3 Additional PCR Procedures

PCR Restricted to Highlights

The PCR gain reduces from the maximum value (unity) at the breakpoint, to zero at the dot % (positive value) selected by the operator. The breakpoint is set (by the system) to a dot % value half way between the operator value and 0% dot. A normal separation without PCR is produced at the shadow end.

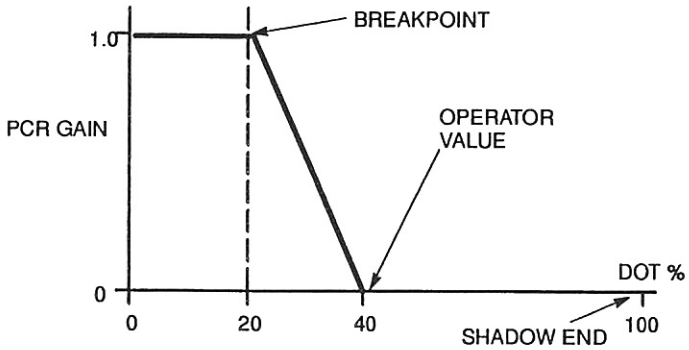


Figure 14.3 PCR restricted to highlights

The sequence of operation is:

Press: CAL

Enter: 525

Press: ENTER

4@ 1.00 00 150
PCR HLT 0

Enter a positive value of dot % up to a maximum of 100%, and

Press: ENTER

The scanner then returns to monitor mode.

PCR Restricted to Shadows

The PCR gain increases from zero at the dot % (negative value) selected by the operator to the maximum value (unity) at the breakpoint. The breakpoint is set (by the system) to a dot % value half way between the operator value and 100% dot. A separation without PCR is produced at the highlight end.

Note: Dot % values selected by the operator are entered as negative numbers.

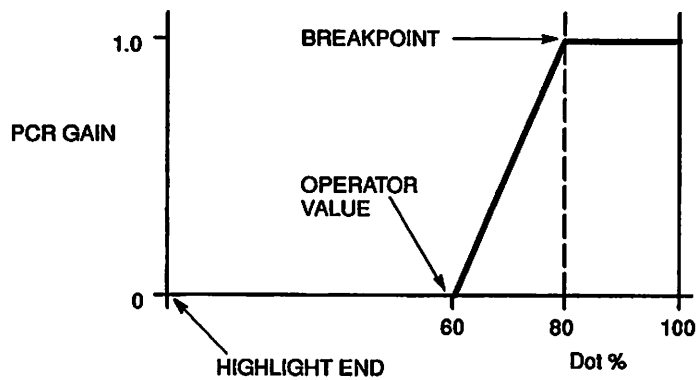


Figure 14.4 PCR restricted to shadows

The sequence of operation is:

Press: CAL

Enter: **525**

Press: ENTER

Enter a negative value of dot % from 0 to -100(%), and

Press: ENTER

The scanner then returns to monitor mode.

14

PCR Highlight Colour Modifier

The PCR Highlight Colour Modifier function removes colour from a specified dot % area. A two-value, dot % entry system is used to select the region to be affected. Once CAL 527 has been selected, the first value specifies a point up to which a black-and-white result will be produced, all colour being removed. The second value specifies a point where the PCR colour is returned to normal. Colour is introduced progressively between the two values.

The sequence of operation is:

Press: CAL

Enter: 527

Press: ENTER

```
4@ 1.00  00  150
PCR B/W 1    0
```

Enter a dot % value (less than 100%), and

Press: ENTER

```
4@ 1.00  00  150
PCR B/W 2    0
```

Enter a dot % value higher than the first value, and

Press: ENTER

The display returns to the monitor mode.

PCR Black Modifier

The PCR Black Modifier function progressively increases or decreases the weight of the Black Printer to approximately 40% dot. It is advisable to check the shape of the black curve when using this function.

The operating sequence is:

Press: CAL

Enter: 528

Press: ENTER

PCR HLT BLACK
CONTROL 1.00

The current index value is displayed. Enter a dot % up to 40%, and

Press: ENTER

The display returns to the monitor mode.

If CAL 528 is entered again the new index number, calculated from the dot % entry, will be displayed.

PCR Colour Gain

The levels of saturation of the remaining colour components, after PCR has been applied, can be adjusted using CAL 520.

This procedure can be used to compensate for local printing conditions but should be used with caution as the effects may not be obvious if you are more familiar with conventional separations.

The operating sequence is:

Press: CAL

Enter: 520

Press: ENTER

COLOUR INK CORR.
FACT 1 1.00

The first of eleven steps is displayed. To step through the series of values:

Press: ENTER

Each step represents a different dot %. The value displayed represents the corresponding gain applied to the colour components remaining after colour removal. The BVs are as follows:

Step	Dot %	Gain
1	0	1.00
2	10	1.13
3	20	1.25
4	30	1.37
5	40	1.50
6	50	1.60
7	60	1.70
8	70	1.95
9	80	2.70
10	90	3.70
11	100	5.50

New values can be entered as required. It is advisable to obtain the new data by constructing a graph of Dot %/Gain. The curve produced can then be modified and new data read off. This method will ensure that there is a smooth transition from step to step.

PCR Black Additivity

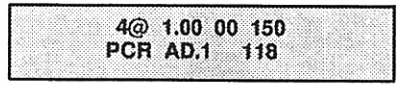
Black additivity (Additivity Factor 1) compensates for additivity failure when PCR generated black is added to the black level computed before PCR was applied.

To change the setting:

Press: CAL

Enter: **521**

Press: ENTER



Enter the new additivity factor.

Press: ENTER

The BV is 118. Increasing or decreasing the value will increase or decrease the black component.

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PCR Colour to Black Additivity

Colour-to-black additivity (Additivity Factor 2) specifies the level of neutral colour mix to especially dark regions to compensate for the inadequate density of 'normal' blacks.

The relationship between CAL 521 (BV = 0.15) and CAL 522 is expected to remain as:

$\frac{1\text{-}100}{x}$ where x is the value in CAL 521.

This relationship is not mandatory. Problems of gloss on less smooth substrates may benefit from an adjustment, which despite not being colorimetrically accurate, is more pleasing to the eye.

To change the setting:

Press: CAL

Enter: **522**

Press: ENTER

```
4@ 1.00 00 150
PCR AD.1  0.15
```

Enter the new additivity factor.

Press: ENTER

PCR Colour Correction

If PCR is set up correctly, perfectly acceptable results will be obtained without the use of PCR colour correction. Marginal improvements can be obtained by using the colour correction procedure but they will only be noticeable when direct and closely inspected comparisons are made.

Before using this procedure ensure that grey balance has been set up correctly. Gain applied to colours after removal of the grey components is a likely exaggerate colour errors.

With full PCR, only two components (of Y, M and C) are required for each colour pixel. By entering a series of six numbers in CAL 526, an increase or decrease may be achieved in the following:

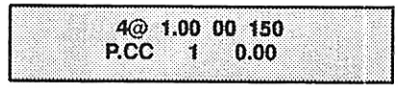
Step	Action
1	Increase/decrease Cyan compt of greens (C + Y)
2	Increase/decrease Cyan compt of blues and violets (C + M)
3	Increase/decrease Yellow compt of reds and oranges (Y + M)
4	Increase/decrease Yellow compt of greens (Y + C)
5	Increase/decrease Magenta compt of blues and violets (M + C)
6	Increase/decrease Magenta compt of reds and oranges (M + Y)

The greatest effect will be visible in the shadow tones.

Press: CAL

Enter: **526**

Press: ENTER



The first of six steps is displayed. To step though the series of values:

Press: ENTER

Enter new values as required.

14

Register Marks, Border Text and Colour Identifiers 15

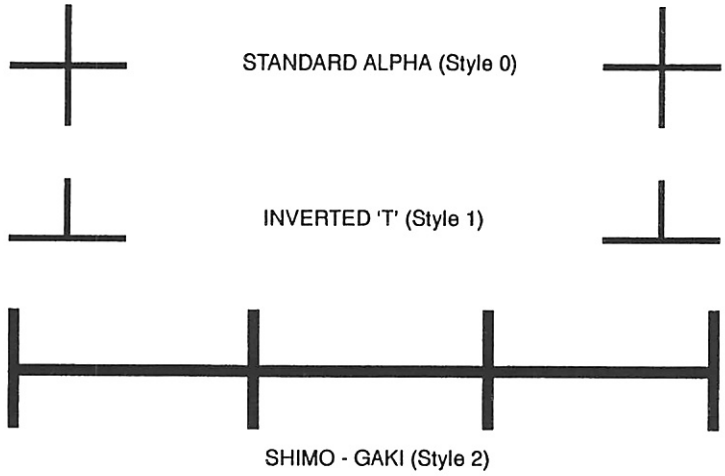
This chapter describes the CAL 880 functions which control the generation of images; register marks, border text and colour identifiers.

Further image generation functions for text etc. are controlled from the Macintosh. These functions are described in the Celsis 6000 Macintosh User Interface Manual, see Associated Documents.

15.1 Introduction

The analyse unit can specify the register marks, border text for film identification and colour identifiers which are to be exposed around the edge of the image. One of three types of marks can be selected, see Figure 15.1.

The Shimo-Gaki mark extends along each edge of the image. With this mark there is not enough space for the text field and the text will automatically be switched off.



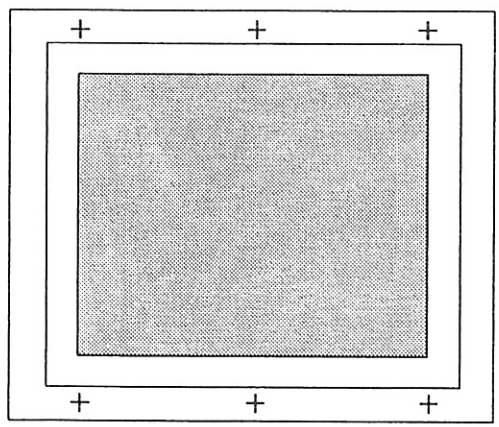

LOCATION OF STYLE 0 and 1 MARKS

Figure 15.1 Register mark specification

15.2 Changing the Register Mark Type

To change or view the current set-up:

Press: CRL

Enter: **880**

Press: ENTER

A display appears indicating the type of mark currently selected.

To change to a different type of mark, enter:

0 for a + type mark

1 for a T type mark

2 for a Shimo Gaki type mark.

To leave the display in the current mode:

Press: ENTER

The current register mark will be used in all subsequent expose sequences.

With the Macintosh powered up, the control over the colour identifiers is from the Macintosh software. The analyse unit display, **COL-ID BLKS ON/OFF** is not used as it will be overridden by the software on the Macintosh.

15.3 Selecting Register Marks, Text and Colour Identifiers

The register mark function can be switched on and off using the CAL 889 function.

To change or view the current set-up:

Press:	CAL	
Enter:	889	
Press:	ENTER	TEXT ENABLED CHANGE YES/NO ?
Press:	↕ YES	TEXT SUPPRESSED

The current selection is displayed for a few seconds before returning to the monitor mode.

15.4 Scanner Generated Vignettes

Scanner generated vignettes can be obtained up to maximum dimensions for all Formats applicable to the scanner type.

The vignettes will be output entirely from the expose unit of the scanner. To create vignettes:

Press: CAL

Enter: 56

Press: ENTER

VIGNETTE EXPOSE
YES/NO

If vignette is not required:

Press: ↔ NO

The Scanner reverts to monitor mode.

If vignette is required:

Press: ↕ YES

VERTICAL (YES) ?
HORIZONTAL (NO) ?

If Vertical is required:

Press: ↕ YES

A two-point linear vignette can be exposed from top to bottom of the film.

If Horizontal is required:

Press: ↔ NO

A two-point linear vignette can be exposed from left to right.

ENTER VIGNETTE
COLOUR 1Y

Colour 1 refers to the first point of the vignette; Y indicates that a dot % has to be selected for the Yellow channel. A high % indicates a dense value for the first point of the vignette; conversely, a low % indicates a light value; default value will be 0% if **[ENTER]** is pressed without a numerical selection being made.

Enter: dot %

Press: ENTER

The value selected appears on right of **1Y**.

The lower line of the Alphanumeric Display changes to **COLOUR 1M**, indicating dot % is to be defined for Magenta channel.

Enter dot % values, in turn, for magenta (M), cyan (C) and black (B) channels. Note registration of values on the displays, as appropriate.

When all colour channels for the first point have been entered, the procedure continues:

ENTER VIGNETTE
COLOUR 2Y

For the second point of the vignette, enter dot % values for Y, M, C and B channels, in turn, in the same manner as for the first point.

Note: If **[ENTER]** *is pressed without specifying a dot % for the channel, a default value is assumed. The dot % will default to 0% or 100% according to whether a high or low value has been entered, respectively, for the first point.*

When colour channels for the second point have been entered, the procedure continues:

ENTER VIGNETTE
HORIZ SIZE

Enter the horizontal size final value in mm. The value is displayed at the right of **HORZ SIZE**.

Press: ENTER

ENTER VIGNETTE
VERT SIZE

Enter the vertical size final value in mm. The value is displayed at the right of **VERT SIZE**.

Press: Analyse EXPOSE to expose the vignette.

Press: ENTER to return to monitor mode.

15

Care and Maintenance 16

This chapter describes the care and maintenance procedures required to maintain the scanner in good working order. It also includes the procedures used to change the xenon lamp and adjust the lamphouse optics.

16.1 General Care

CAUTION

There must be NO SMOKING, EATING OR DRINKING in scanner rooms.

Perform the following checks each day:

- Ensure that the environmental conditions are within the permitted ranges.
- Check the cleanliness of the area.

16.2 Scanner Care

The Celsis 6100 Scanners are designed to require minimal maintenance and servicing. Some parts of the scanner are sealed for safety and cleanliness and must not be touched.

The inside of the unit, under the lids, should be kept as free as possible from dust and dirt. The ventilation grilles must be kept clear to allow good ventilation.

The analyse unit will give best results if it is left switched on as much as possible, even overnight and at weekends.

After 30 minutes of inactivity, the scanner will enter 'Standby Mode'. In this mode the carriage will creep very slowly (average speed 1.2 mm/hour) towards the datum position. This is to ensure that a transparency is not exposed to the scanning light for a prolonged period.

Any key-press or remote instruction from the Macintosh terminal will cancel standby mode and return the scanner to normal operation. The carriage will NOT return to its previous position. Please note that any key pressed will be obeyed.

Cylinders are manufactured to close tolerances and must be handled carefully to avoid damaging them.

Analyse cylinders are easily scratched, so it is strongly recommended that the operator removes any rings, cuff-links and watches that might come into contact with the cylinder. All hard or sharp objects such as combs, keys, etc., should be kept away from the cylinders.

Cylinder cleaning methods are described in Chapter 5. Ensure that the safety procedures are followed and that only recommended cleaning products are used.

16.2.1 Routine Maintenance

The following regular procedures must be performed to ensure first-class scanner performance.

Daily

Check that the two cooling fans mounted together on the rear panel of the analyse unit are operating.

Weekly

Adjust the lamphouse optics.

Clean the inside of the analyse cylinders with anti-static fluid.

Clean the analyse lens with a cotton bud and some lens cleaner.

Inspect the centre optics lenses. Should the collars be found to be loose, contact Crosfield Electronics.

WARNING

Do not attempt to rotate a stuck leadscrew by hand unless the power to the scanner is OFF. Failure to observe this precaution MAY RESULT IN INJURY.

Lubricate the leadscrew. Apply one drop of Maccurat 32 oil at each end of the leadscrew and one drop in the middle.

16.2.2 Changing the Xenon Lamp and Top Lead

Note: It is possible that the lamp may burst in use. If this occurs the service engineer should be called to replace the lamp and rectify any further damage that may have been caused.

Indications of Failure

There are two main indications that the lamp is failing and must be replaced:

- If there are streaks on the film and it is certain that they are not caused by the film processing, the xenon lamp may be the cause.
- If there is insufficient light for autobalance, this is probably due to falling light output from the lamp.

In addition, if ozone is generated by a xenon lamp the lamp must be changed immediately. If this condition arises when a new lamp has been fitted, assuming it has been warmed up, ensure that the correct type has been fitted.

When streaking occurs and it is certain that it is not caused by the film processing or the xenon lamp, adjust the lamphouse optics as described later in this section.

Lamp Suppliers

Not all lamps which are claimed to be suitable as replacements are made to the required quality and reliability. The following suppliers have been approved for the supply of replacement lamps:

Ushio Inc. Bankrashof 3 1183NP Amstelveen KU The Netherlands	Hammamatsu Photonics Lough Point 2 Gladbeck Way Windmill Hill Enfield EN2 7JA
Telephone: 020-455315	Telephone: 0181-367 3560 Fax: 081-367 6384

Essential Notes on Safety

Operators are expected to change the xenon lamp when necessary. This is a simple procedure but certain safety precautions must be strictly observed.

The lamp is run at high pressure and temperature. It emits a considerable quantity of ultra-violet light.

- The lamp must not be handled when hot or viewed directly when lit.
- The lamp must be switched off and allowed to cool for at least half an hour before being handled.
- A protective headguard with visor, and gauntlets, must be worn when handling the lamp. The use of gauntlets will also prevent contamination of the quartz envelope of the lamp by finger grease.
- A plastic safety cylinder must be placed around the lamp when it is to be removed from or replaced in the lamphouse.

Procedure

1. Switch off the analyse **SCANNER** switch. Remove the bottom left-hand front panel of the analyse unit to gain access to the xenon lamp supply.

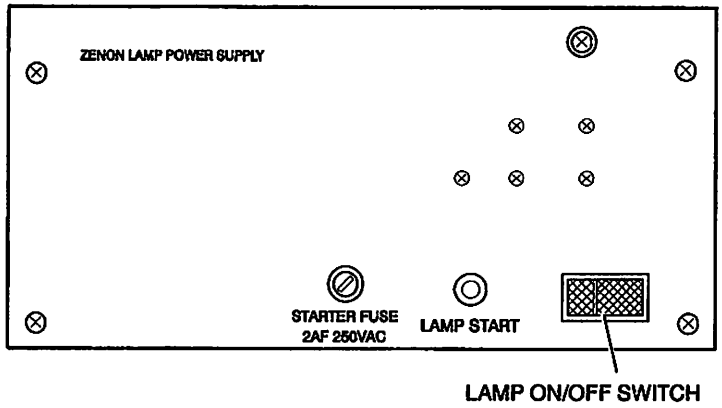


Figure 16.1 XLS front panel

2. Switch off the lamp by means of **two** switches. One is on the operator control panel (**LAMP**), the other is on the XLS front panel (see Figure 16.1).

   On scanners built after mid 1993 there is no longer an XLS switch and the lamp is turned off using the **LAMP** switch only.

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WARNING

Ensure that the switches have been turned off.

Allow half an hour for the lamp to cool.

Put on the headguard, visor and gauntlets.

3. Use the Allen-key driver to remove the two screws 'A' in Figure 16.2. Take off the lamp cover.

4. Place the two halves of the plastics cylinder around the centre of the lamp and secure with the spring clips.

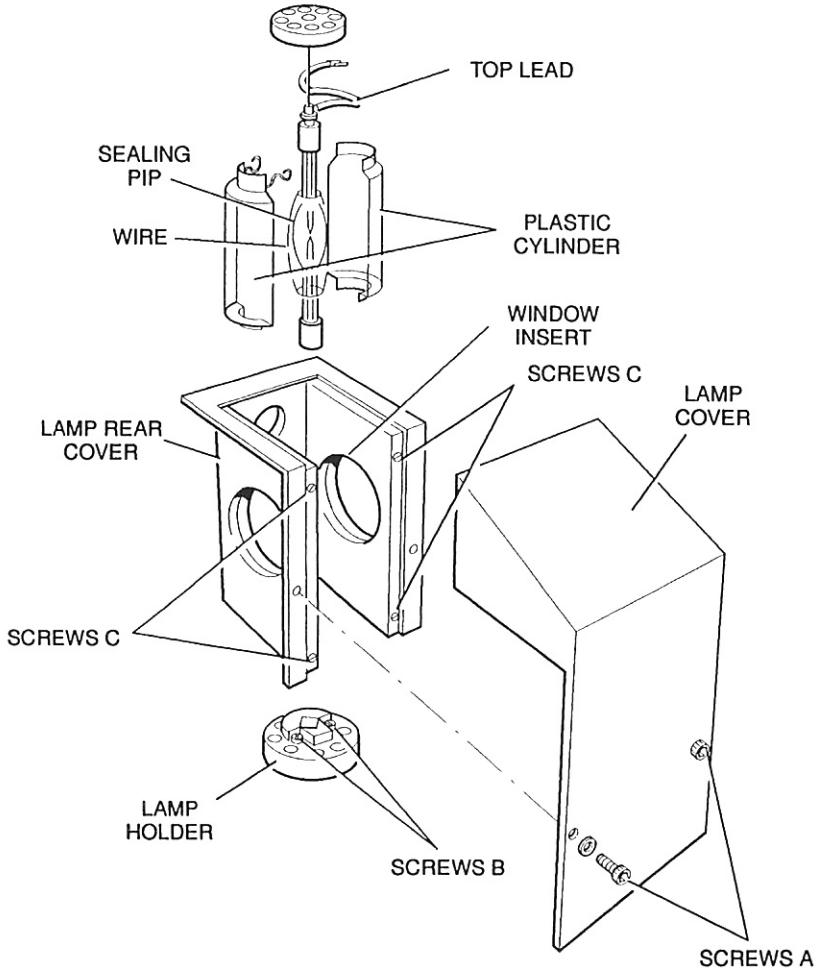


Figure 16.2 Xenon lamp assembly

5. Taking care not to knock the lamp, pull the top lead off the tag behind the lamp. The wrench from the tool kit may be used (slip-joint pliers, Part No. 9990-4013).

6. Loosen two screws 'B' with the Allen-key driver (Part No. 9990-3411), whilst holding the lamp steady in its plastic cylinder. Remove the lamp and place it on a working surface.

CAUTION

Do not twist the lamp when removing or replacing the top lead.

7. Hold the positive, metallic end of the lamp with one wrench and unscrew the top connector with the other wrench. Remove the lamp top lead. Place the lamp in its protective box.

8. Inspect the top lead. The insulation will have deteriorated in use. If the insulation is in poor condition, the lead should be replaced. If the insulation is in good condition, then inspect the ring terminal at the lamp end of the top lead. Clean the terminal with fine emery cloth if necessary, to ensure good electrical contact when replaced on the new lamp.

9. Take a new lamp with its protective plastic cylinder in place. Fit the top lead to the end of the lamp marked + (positive end). Hold this end firmly with one wrench whilst tightening the top connector with the other wrench.

10. With the plastic cylinder still in place, fit the lamp into the lamp base. Make sure that:

    - the positive terminal is uppermost
    - the lamp sealing pip is facing the back of the lamphouse.

    Tighten two screws 'B' with the Allen-key driver, whilst holding the lamp steady in its plastic cylinder.

11. Fit the top lead to the tag behind the lamp. Remove the spring clips and two halves of the plastic cylinder from around the lamp.

12. Replace the lamp cover and secure with two screws 'A'.
13. Ensure that the **SCANNER** switch on the control panel is off.

CAUTION

Damage to the electronics unit may result if the lamp is switched on when the scanner is on.

14. Switch on the lamp as follows:

    a) Operate the **LAMP** switch on the operator control panel.

    Note: Scanners built after mid 1993 have no XLS switch and the following lamp power-up operations are not required. On these scanners go to Step 15.

    b) Switch the **MAINS ON/OFF** switch on the XLS front panel to on.

    c) Momentarily depress the **LAMP START** push-button switch on the XLS front panel. Do not keep the switch depressed, as this may cause damage to the XLS.

    The lamp starter will make a noise for about one second, after which the lamp should light. The **MAINS ON** indicator lamp should also light. If the lamp does not light, press the button again, after waiting at least five seconds. Repeat until the lamp lights. Most lamps light the first time but some may require two or even three attempts, especially when cold and/or new. If the lamp fails to light, turn off the **LAMP** switch on the control panel. Check that the lamp is correctly fitted.

15. When the lamp lights, switch on the **SCANNER** switch on the control panel.
16. Thirty minutes after the lamp has lit, adjust the lamphouse optics controls to achieve optimum light output. See the next section.

17. The luminous intensity of a new lamp will change rapidly during its first half-hour of life, with a slower variation during the next two or three hours. After two days, its intensity will become stable. Repeat the lamphouse adjustment every few hours until the lamp is stable.

18. In many countries the xenon lamps are guaranteed for 1,000 hours. If they fail before this time a refund can be obtained on receipt of the failed lamp in its original packaging. Hence the packaging of a new lamp should be kept in case of premature failure. It is suggested that the packaging be placed in the front right-hand vertical member of the frame.

19. The old lamp should be destroyed in the following manner. It should be placed in a thick cardboard box or Jiffy bag and smashed with a hammer. The headguard with visor, and gauntlets must be worn.

16.2.3 Adjusting Lamphouse Optics

The lamp is in a fixed position and cannot be adjusted. If the lamp is changed or the lamphouse is interfered with, the lamphouse optics must be adjusted to achieve optimum light output.

After switching on a new lamp, allow at least half an hour (preferably longer), for the temperature to stabilize, before making adjustments. These should be repeated every few hours until the lamp is stable. Thereafter, weekly adjustment is sufficient.

Transmission Copy

1. Fit the large cylinder and check that the scanning spot is centered on the cross-hair. Do this with the use of **[CAL] 40** (analyse aperture 4D should be used).

2. Perform an Autobalance:

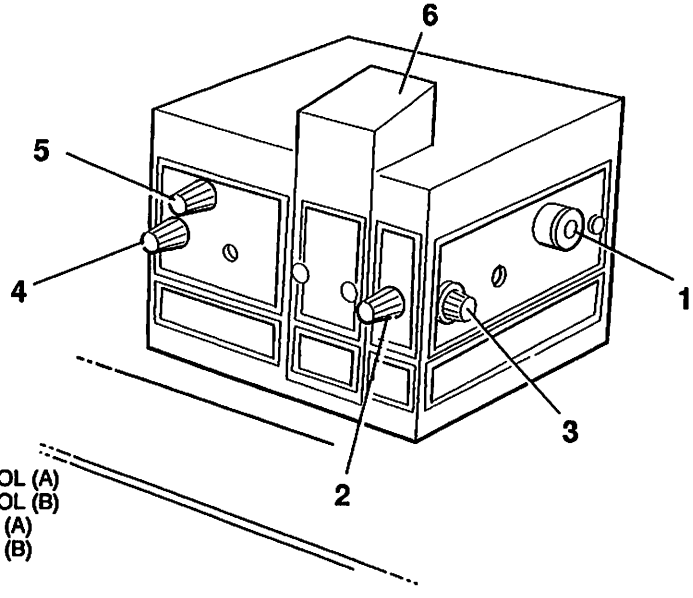
Press: AUTO BAL

AUTO BAL Y/N?

Press: YES

If machine fails to autobalance due to poor lamp position, a lower density lamphouse filter should be selected (e.g. C, B or A).

3. Monitor a neutral density of approximately 0.4. Set the lamphouse transmission-adjusters A and B so that minimum density read-out is observed on the Magenta channel.



1. NEUTRAL FILTER KNOB
2. TRANSMISSION ALIGNMENT CONTROL (A)
3. TRANSMISSION ALIGNMENT CONTROL (B)
4. REFLECTION ALIGNMENT CONTROL (A)
5. REFLECTION ALIGNMENT CONTROL (B)
6. LAMP COVER

Figure 16.3 Location of lamphouse controls

4. Autobalance now using 4D, if this was not achieved previously. Monitor the original density read-out on the Magenta channel. Turn the lamphouse transmission adjuster B

anti-clockwise until this read-out increases in density by between 0.10 and 0.15.

Reflection Copy

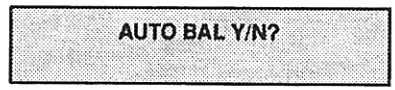
1. Fit Reflection copy blanking plug and large cylinder. Mount white reference patch on cylinder (e.g. Part No. 5511-4140, or other white copy will do), and focus on it.

2. Press:

3. Perform an Autobalance:

   Set the analyse aperture to 5

   Press:

   Press:

   Note: If machine fails to autobalance due to poor lamp positioning continue anyway.

4. Select Aperture 3. This gives 0.50 density. Observe density readout on Magenta. Turn lamphouse reflection Adjusters A and B to give a minimum density reading.

5. Turn Adjuster B anti-clockwise to increase the density by between 0.1 and 0.15.

6. If autobalance was not achieved previously, select Aperture 5 and re-autobalance.

Note: The selection of a density of between 0.10 and 0.15 above minimum moves the lamp cathode image away from the analyse lens aperture and sets the xenon arc to a stable position.

16.3 Expose Unit Calibration

Some expose units do not have a full keyboard, in which case the calibration routine must be controlled from the analyse unit.

Daily output calibration is necessary to compensate for variations in the expose unit and film. The output is controlled by changing the laser power.

The power level required will also depend on the type of scan which is to be performed. When scanning combined text and graphics using Turret C or when using FM screening, the expose drum rotates at a slower speed and requires a different power setting, see below:

- Turret C text and graphics $^3/_4$ speed
- Turret A FM screening full speed
- Turret B FM screening $^3/_4$ speed
- Turret C FM screening $^1/_2$ speed.

The expose unit can be set up each power level and will switch between them automatically, depending on the application.

The calibration procedure is performed in two steps:

1. perform a calibration scan
2. adjust the power level.

16.3.1 Procedure

This creates a 32-step greyscale using the laser power level for the required application.

1. Load film on the expose unit.

2. Press CAL then EXPOSE to display the five laser power options:

```
>0 1  2  3  4  5  6
STD CAL EXPOSE
```

3. Press 0, 1, 2, 3, 4 or 5 to highlight the required calibration option (**STD CAL EXPOSE, C 3/4 CAL EXPOSE, A FM CAL EXPOSE, B FM CAL EXPOSE, C FM CAL EXPOSE** or 6 = **EXIT**.

   Press ENTER to expose a 32-step greyscale for the currently highlighted option.

   Note: Pressing ENTER *while* **EXIT** *is highlighted leaves the calibration facility.*

4. Measure the dot % of step 16 on a correctly calibrated densitometer. This should be 48%.

5. If the dot % is not correct, an adjustment to the laser power must be made. Power adjustment is described in the following subsections.

   The correct power level can be obtained by exposing a series of calibration greyscales at different power levels and selecting the power which produces the correct result. If necessary, produce a graph comparing the dot % of step 16 with a range of power levels and read off the required power level for 48% dot.

6. When the required power level has been selected, expose another greyscale at the new power setting to confirm that step 16 is now 48%.

16.3.2 Changing the Laser Power Level

CAL 46 is the recommended procedure for adjusting the laser power. This procedure is performed from the expose unit keyboard.

To adjust the laser power:

1. Press: CAL

   Enter: **46**

   Press: ENTER

   ```
   >0 1 2 3 4 5 6
   STD LASER POWER
   ```

2. Press 0, 1, 2, 3, 4 or 5 to highlight the required option (**STD LASER POWER, C 3/4 LASER POWER, A FM LASER POWER, B FM LASER POWER, C FM LASER POWER** or 6= **EXIT**.

   Press ENTER to select the required option.

   ```
   STD PWR = 03.2 MW
   NEW POWER =
   ```

   Note: Pressing ENTER *while* **EXIT** *is highlighted leaves CAL 46.*

3. Enter the new laser power level required for the selected scanning option. For example, to enter 2.9 mW:

   Enter: **2.9**

   The laser current is displayed, then the next laser power level is requested.

   When an entry has been made the laser current is displayed.

If the current demanded is too high or too low, an alternative display appears:

POWER NOT ATTAINED LASER TO STANDBY

If the laser current exceeds 9 A:

POWER = 5.2 MW @ 9.0A RUN Y/N

As the laser current rises above 8 A, the laser is nearing the end of its useful working life and requires servicing or replacement. The laser can be run at this current but you should arrange for it to be serviced or a replacement to be fitted. The current should not exceed 9 A.

4. Record the entered power levels in the equipment logbook.

16.3.3 Switching Between Run and Standby Modes (CAL 47)

To prolong the life of the laser it is automatically switched to the Standby mode after half an hour without an exposure, and whenever is selected. The laser is automatically switched back to the Run mode if either **[CAL] 46** is entered or **[EXPOSE]** is pressed.

The laser power, set using **[CAL] 46**, is remembered by the scanner, even if switched off.

With the laser on standby:

Press:

Enter: **47**

LASER ON Y/N

Press:

With the laser on standby:

Press:

Enter: **47**

Press:

to switch the laser to standby.

16

Faultfinding 17

This chapter describes the procedures to be followed when faults are discovered.

This chapter also lists operator-error messages which appear on the analyse-unit Alphanumeric Display and indicates their meaning. One of a number of machine-error messages may also appear. If the meaning of the message or the appropriate action is not understood, please contact Crosfield Customer Services.

17.1 Faultfinding Chart

Symptom	Cause
No power to analyse unit.	1. Check mains power to analyse unit is on. 2. Check the 'mushroom' Emergency Off switch. Press once then try analyse switches again.
No response from analyse control panel and panel not illuminated.	Analyse unit switched off.
No response from analyse control panel but panel illuminated.	Unit locked up. Switch unit off then on again. If problem persists, call service engineer.
All readings in Current Value display very high.	1. Xenon lamp switched off or failed. 2. The wrong centre-optics lens is fitted or incorrectly positioned.
Machine does not autobalance correctly or long autobalance sequence.	1. Xenon lamp switched off. 2. Analyse lens not properly home. 3. Analyse lens in wrong position. (Retracted when small analyse cylinder in use.) 4. Analyse head (spot) misaligned. Use Cal 40. 5. Incorrect lens fitted in centre-optics tube. 6. Lamphouse alignment controls not set properly. 7. Lamphouse window broken. 8. Xenon lamp failing. 9. Dirty area of clear cylinder being used or Autobalancing on transparency.

Symptom	Cause
Machine does not autobalance. (Continued)	10. Clean central optics and analyse lenses. 11. Check that the white autobalance patch (reflection) is clean. 12. Check that the analyse focus is sharp on a typical example of copy (this is to ensure that the analyse focus is not drastically out). 13. Corrupted autobalance targets, check CAL 502.
Analyse traverse does not operate with cylinder removed.	Cradle/lens in wrong position. Turn scanner off and back on again, if problem remains call a service engineer.
'Illuminated' buttons do not light.	Lamps switched off. Use Cal 0 to switch lamps on.
Random streaks of different expose levels superimposed on separation.	Xenon lamp failing. If a new lamp try de-peaking the lamp by 0.15
Streaks on film.	Check that lamp is correct way round with the pip at the top and back.
Separation film is speckled.	Too much USM Sharp used on grainy original. Threshold set too low.
Separation film shows halos and lines at changes in contrast.	Too much USM Sharp used.
'VIEW' gives dim illumination.	Reflection copy lamphouse controls not set properly. Check that lamp is correct way round with the pip at the top and back.
Xenon lamp cannot be switched on.	1. 'LAMP' switch off at at operator control panel. 2. XLS switched off. 3. Lamp cover not fitted properly.
Lamp fails to start and buzzing noise is heard.	Top lamp-lead may be faulty. Try changing it. A spare is provided in the Support Pack.
Sputtering noise from lamphouse during lamp switch-on.	This is normal.

17.2 Operator Error Messages

Main Function	Error Message	Possible Cause and Solution
CYLINDER CHANGE	ROTATE CYLINDER	Cylinder has to be rotated to calculate position.
POSITION	POSN ENTRY ERROR	The second Position has not been entered or Position entry is invalid. Perform a Datum search and enter both positions again via 'POSN' function.
FINAL SIZE	O/P TOO WIDE O/P TOO HIGH	The 'ENLARGEMENT' x 'INPUT SIZE' value is greater than that allowed for the current format selection - check 'FINAL SIZE'.
FINAL SIZE/FORMAT	H ERROR! V ERROR!	Output size has been entered to the nearest 0.1 mm. Enter output size as a whole number.
ENLARGEMENT	ENLRGMT INVALID	The 'ENLARGEMENT' value entered is outside the range allowed for the type of cylinder in use - check the valid range of 'ENLARGEMENT' allowed for large and small cylinder.
COLOUR/EW/EB	WRONG COLOUR OR TONAL REGION	The edit being performed in selected region is not allowed if the analyse head is not aimed at the selected region - check, in 'VIEW' mode, the region being monitored and then check in which region the edit was requested.
AUTOBALANCE	ERR W:YMC B:YMC	This gives an indication as to the area where 'AUTOBALANCE' has failed. Try 'AUTOBALANCE' again. Check CAL 502, if there are incorrect entries then correct them, if already correct then call service engineer.
USM	I/P OVER RANGE	You have entered a value which is too high, i.e. outside the permitted range. Check the permitted range and re-enter.

17

Reference Data 18

This chapter provides a quick reference to data frequently used when operating the scanner.

18.1 Analyse Unit Data

18.1.1 Scanner Fact Chart

CYLINDER	ENLARGEMENT %		%	Analyse Aperture	Analyse Filter
LARGE	*20	-	80	5	D
(Transmission)	20	-	40	4	D
	41	-	80	3	C
	81	-	200	2	B
	201	-	800	1	A
LARGE	20	-	40	4	N/A
(Reflection)	41	-	800	3	N/A
SMALL	75	-	299	2	B
	300	-	2000	1	A

**Note: Use only Aperture 5 in range 20 - 80% when scanning subjects with fine edges.*

18.1.2 USM Functions and Settings

		CAL 508								
		Front Panel								
		Sharp	Smooth	Black Gain	Threshold	Fringe Clip	D1	D2	Yellow Gain	Magenta Gain	Cyan Gain	Neg Gain	White Attenuator
Average Trans Settings		4/5	3/4	4	5/8	127	150/200	225/255	3/6	1/2	1	1/2	3
Big Enlargements		3/5	2/3	4	5/8	90/127	150/180	200/255	3/6	1/2	1	1	3/5
PCR		3/5	2/3	8/12	5/8	90/127	150/180	225/255	4/6	1/2	1	1	3/5
Fine Detail Sharpness		5/7	2/3	4/8	5/8	70/110	150/180	225/255	5/7	1/2	1	1/3	7/9
Fleshtones		3/5	3/4	4	5/8	90/127	150/180	200/255	4/6	1/2	1	1	3/4
Grainy Originals		2/4	3/6	4	10/15	110/127	150/180	200/255	5/7	2/3	1	1	3
Colour Prints		3/5	2/3	4/8	5/8	80/127	150/180	180/255	3/6	1/2	1	1/2	3
Water Colours		2/4	3/6	1/4	5/10	100/127	100/150	150/200	3/6	1/2	1	1	3

18.2 EDG Facilities

18.2.1 EDG Angle Codes and Angles

Angle Code	Description	Nominal Angles			
		1	2	3	4
0	Nominal	165	45	90	105
1	Neoscan +ve	170	50	95	110
2	Toppan +ve	15	75	120	135
3	Flexo	98	158	83	38
4	Hel Prg 4	108	162	45	45
5	Hel Prg 130	108	162	0	45
6	One Angle	45	45	45	45
7	66/96/51/36	156	96	51	36
8	M.P.D	76	23	57	147
9	Plan Film	165	45	90	105
11	Neoscan -ve	100	40	175	160
12	Toppan -ve	75	15	150	135
20	Eq. Ruling	165	45	90	105
23	Fl. Low Y	98	158	83	38
25	Neroc	108	162	0	45
28	Kavisha	75	105	23	15
33	Rubens	113	53	8	173
40	Nom. Swap	105	45	90	165
60	Eq. LPI	165	45	90	105
80	Nominal X2	165	45	90	105
99	6/7	165	45	90	105
99	13X	165	45	90	105
99	1/2	165	45	90	105
99	5/9	165	45	90	105
99	2/3	165	45	90	105
99	Flexo	158	38	98	83

Note: The angle code 99 covers several angle families which are not in common use.

18.2.2 Nominal Rulings

Family	Angle Code	Nominal Rulings l/in (l/cm) Resolution l/mm 8 Turret A	12 Turret B	16 Turret C	Screen-Set No.
Nom.	0	146 (57)	219 (86)	292 (115)	75
		142 (56)	213 (84)	284 (112)	10
		116 (46)	174 (69)	232 (92)	11
		98 (38)	147 (58)	196 (76)	0
		86 (34)	129 (51)	172 (68)	12
		82 (32)	123 (48)	164 (64)	13
		70 (28)	105 (42)	140 (56)	14
		58 (23)	87 (34)	116 (46)	15
		50 (20)	75 (31)	100 (41)	16
		34 (13)	51 (20)	68 (27)	17
		24 (10)	36 (15)	48 (20)	18
		16 (6)	24 (10)	32 (13)	19
		12 (5)	18 (8)	24 (10)	20
		8 (4)	12 (5)	16 (7)	21
		6 (2)	9 (4)	12 (5)	22
N'Scan +ve	1	102 (40)	153 (60)	204 (80)	6
		76 (30)	114 (45)	152 (60)	27
N'Scan -ve	11	102 (40)	153 (60)	204 (80)	5
		76 (30)	114 (45)	152 (60)	28
Toppan +ve	2	115 (45)	173 (68)	230 (91)	76
		104 (41)	156 (61)	208 (82)	29
		88 (35)	132 (52)	176 (70)	45
		86 (34)	129 (51)	172 (68)	40
		70 (28)	105 (42)	140 (56)	30
Toppan -ve	12	115 (45)	173 (68)	230 (91)	77
		104 (41)	156 (61)	208 (82)	31
		88 (35)	133 (52)	177 (70)	46
		86 (34)	129 (51)	176 (68)	41
		70 (28)	105 (42)	140 (56)	32
Flexo	3	151 (60)	227 (89)	302 (119)	85
		133 (52)	199 (79)	266 (105)	84
		100 (39)	150 (59)	200 (78)	51
		86 (34)	129 (51)	172 (68)	48
		78 (31)	117 (46)	156 (62)	52
		66 (26)	99 (40)	132 (53)	53

Note: The screen rulings listed are nominal and may not be identical to the entries in the Alphanumeric display on the analyse keyboard.

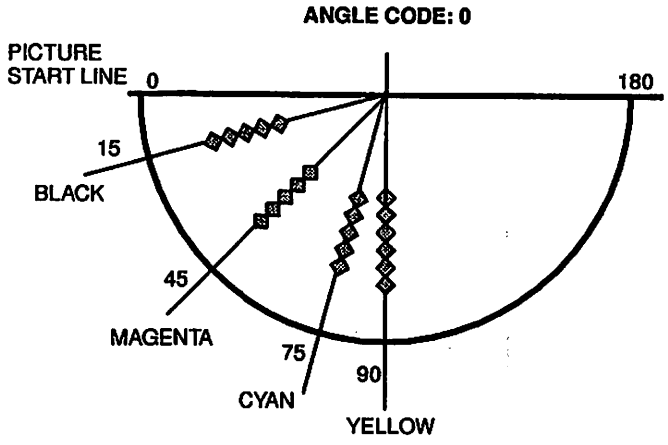
Family	Angle Code	Nominal Rulings l/in (l/cm) Resolution l/mm 8 Turret A	12 Turret B	16 Turret C	Screen-Set No.
Flexo	3	56 (22)	84 (34)	112 (45)	49
		42 (17)	63 (25)	84 (34)	50
Flexo low Y	23	100 (39)	150 (59)	200 (78)	58
		86 (34)	129 (51)	172 (68)	56
		78 (31)	117 (46)	156 (62)	59
		66 (26)	99 (40)	132 (53)	60
		56 (22)	84 (34)	112 (45)	57
Hell Prg 4	4	114 (45)	171 (68)	228 (90)	25
		86 (34)	129 (51)	172 (68)	26
Hell Prg 130	5	102 (41)	153 (61)	204 (82)	23
		76 (30)	114 (46)	152 (61)	24
One Angle	6	86 (34)	129 (51)	172 (68)	36
		82 (32)	123 (48)	164 (64)	37
		72 (28)	108 (43)	144 (57)	38
		56 (22)	84 (34)	112 (45)	39
66/96/51/36	7	78 (31)	117 (46)	156 (62)	42
		68 (27)	102 (41)	136 (54)	43
Plan Film	9	196 (77)	294 (115)	392 (154)	2
MPD	8	148 (58)	222 (87)	296 (116)	47
Neroc	25	137 (55)	205 (82)	274 (110)	78
Kavisha	28	141 (56)	212 (85)	282 (113)	79
Rubens	33	125 (50)	188 (75)	250 (100)	80
		109 (44)	164 (65)	218 (87)	81
		100 (40)	150 (60)	200 (80)	82
		77 (31)	116 (46)	154 (62)	83
Nom Swap	40	98 (38)	147 (58)	196 (76)	54
		116 (45)	174 (69)	232 (92)	55
Eq Ruling	20	102 (40)	153 (58)	204 (76)	44
		90 (35)	135 (53)	180 (71)	70
		86 (34)	129 (51)	176 (69)	69
		80 (31)	120 (47)	172 (68)	66
		81 (32)	122 (48)	163 (64)	64
		62 (24)	93 (37)	127 (50)	61

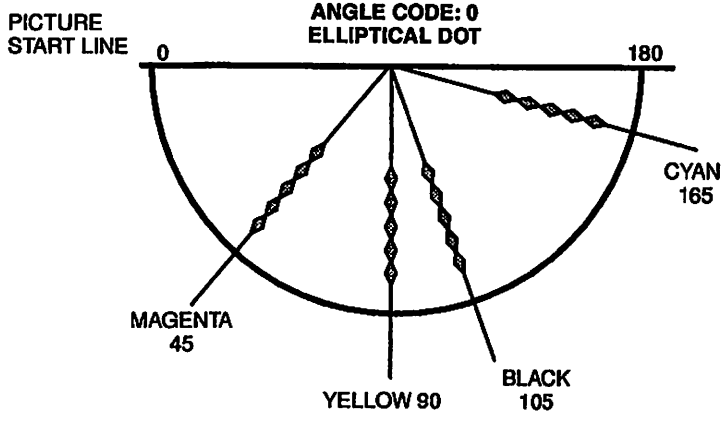
Note: The screen rulings listed are nominal and may not be identical to the entries in the Alphanumeric display on the analyse keyboard.

Family	Angle Code	Nominal Rulings l/In (l/cm)			Screen-Set No.
		Resolution l/mm			
		8 Turret A	12 Turret B	16 Turret C	
Eq Ruling	60	150 (59)	225 (88)	300 (118)	74
		125 (49)	187 (74)	250 (98)	73
		110 (43)	165 (65)	220 (87)	72
		100 (39)	150 (59)	200 (79)	71
		89 (35)	133 (53)	178 (70)	68
		87 (34)	132 (52)	175 (69)	67
		84 (33)	127 (50)	170 (67)	65
		80 (31)	120 (47)	160 (63)	63
		66 (26)	98 (38)	130 (51)	62
Nominal X2	30	244 (96)	366 (144)	488 (192)	86
		228 (92)	342 (138)	456 (184)	87
		196 (76)	294 (114)	392 (152)	88
		172 (68)	258 (102)	344 (136)	89

Note: The screen rulings listed are nominal and may not be identical to the entries in the Alphanumeric display on the analyse keyboard.

18.2.3 EDG Screen Angle Sets





Note: These illustrations show the measured angles when viewed through the back of the exposed film

18.3 Operator's Calibration Numbers

The following table lists Calibration numbers, including the associated Recall and Store numbers. (* denotes post 9.32 s/w.)

Description	Command Access	Recall	Store
Panel Light On/Off	0		
32-Step Calibration	1	101	201
Permanent Tone Boosts	10	110	210
Black Printer Data	11	111	211
Colour Correction	12	112	212
Grey Balance	13	113	213
UCR and PCR	14	114	214
Cast 2		115	215
Cast 1		116	216
Catchlight		117	217
Limits		118	218
EDG Data		119	219
Breakpoints:			
EW dot %	20	120	220
EB dot %	21	120	220
Cast Data (Screen)	25	120	220
Auto EW	27	120	220
E/W Via Keypad	28		
E/B Via Keypad	29		
Resolution		121*	220*
All CVs in Use	30	130	230
Single CVs in Use	31		
Single CVs Edited	32		
Recall BV		199	
Picture Distortion	33		
Separation Gap for Expose Hold	34		
Start of 2nd Separation	35		
Quadrant Print-out	37		
Negative Black Printer	38		
Micro Enlargement	39		
View Scan Spot	40		
Insert A patch Filter	41		
Insert B Patch	42		
Expose Head Position	43		
Select Laser Power	46		
Laser to Standby	47		
Plan Film Marks for next Separation	48		

Description	Command Access	Recall	Store
Vignettes	56	156	256
PCR Max Ink %	65		
Customer Configuration	466		
Tone Curve PD	500		
Tone Curve TD	501		
Autobalance Targets	502	152	252
Luminosity Values	503	153	253
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PCR - Additivity Factor 1	521)		
PCR - Additivity Factor 2	522)		
PCR - 3 Col Under Black	523)		
PCR - Max Blk Percentage	524)	114	214
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Display Phase Loop Board Installed	970		

Description	Command Access	Recall	Store
Display Intelligent S/W Versions	998		
Display S/W Version	999		

18.4 Density/Dot % Conversion Table - Soft Dot

Integrated Density	Dot %	Integrated Density	Dot %
0.00	0	0.38	52
0.01	2	0.40	54
0.02	5	0.42	56
0.03	7	0.44	58
0.04	10	0.46	60
0.05	11	0.48	62
0.06	13	0.51	64
0.07	15	0.54	66
0.075	16	0.57	68
0.08	17	0.60	70
0.09	19	0.63	72
0.10	20	0.67	74
0.11	22	0.71	76
0.13	24	0.75	78
0.14	26	0.79	80
0.16	28	0.84	82
0.18	30	0.89	84
0.19	32	0.96	86
0.21	34	1.05	88
0.22	36	1.12	90
0.24	38	1.20	92
0.26	40	1.35	94
0.28	42	1.42	95
0.30	44	1.50	96
0.32	46	1.70	98
0.34	48	2.00	99
0.36	50		

Note: Using this table, it is possible to determine dot % with fair accuracy, using a good densitometer. For high accuracy, a conversion table has to be made, to suit the particular densitometer.

18.5 Abbreviations

Abbreviation	Meaning	Abbreviation	Meaning
AUTOBAL	Autobalance	HL	Highlight
AN	Automatic Neutralization	JV	Job Value
AUTO	Automatic Generation	LAT REV	Lateral Reversal
B	Black	LMTS	Limits
BLAK	Black Printer (Block)	LUM	Luminosity
BP	Breakpoint/Enter Black	M	Magenta
BV	Basic Value	MT	Midtone
C	Cyan	NEG	Negative
CAL	Calibrate	NTON	Neutral Tone
CC	Colour Correction	OPCAL	Output Calibration
CDT	Colour Data Terminal	ORG	Original
CE	Cancel Entry	PCR	Polychromatic Colour Removal
CHNB	Channel Boost	POS	Positive
CLT	Catchlight	POSN	Position
COL	Colour	PSCR	Pastel Boost
CST1	Cast 1	PTBS	Permanent Tone Boosts
CST2	Cast 2	R	Red
CV	Customer Value	RDY	Ready
CYL	Cylinder	REC	Recall
EB	Enter Black	RESN	Resolution
EDG	Electronic Dot Generation	SEP	Separation
ENHC	Enhanced Colour	SH	Shadow
EW	Enter White	SL	Slope
EWEB	Enter White/Enter Black	UCR	Under Colour Removal
FORM	Format	USM	Unsharp Masking
G	Green	V	Violet
GBAL	Grey Balance	Y	Yellow